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On Communications

Down-to-Earth User
Evelyn Olschewski

- Special Section: Bypass Options
- Cincinnati Bell: The New Empire
- The Future of Value-Added Nets
- Telecom Users Unite

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CONTENTS

WHATEVER THE RANGE OF YOUR NETWORKING NEEDS, DIGITAL HAS THE BEST ENGINEERED SOLUTIONS.

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A good network today is a single computing entity. It shares resources automatically. It is so flexible it can change size, shape, even purpose with minimal impact on your users and your pocketbook. More than accommodating new technologies, a good network invites them.

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DECnet™ software is the centerpiece of Digital networking products. The new Phase IV Version is compatible with virtually every processor and operating system Digital makes. This allows you to build networks using essentially any combination of Professional 350s,™ PDP-11,™ VAX,™ DECsystem-10,™ and DECSYSTEM-20™ computers. DECnet Phase IV also accommodates the Ethernet protocol.

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PRODUCT RANGE GIVES YOU EXTRAORDINARY NETWORKING FLEXIBILITY.

Within a single networking architecture, Digital makes some eighty discrete products.

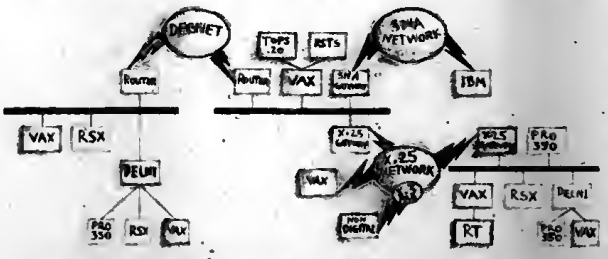
At the local level, Digital's Ethernet repeaters allow you to extend your LAN to link departments, buildings, or projects as needed. New systems simply clamp onto the coaxial cable with interfaces that take just minutes to install. Add Digital terminal servers and you break the dependency between terminals and specific processors. This allows any user on the LAN to access the resources of any host.

Add Digital communication servers and you can connect LANs to wide area networks.

Digital supports cooperative computing with special gateways that translate protocols between unlike architectures. One gives you access to the X.25 packet-switching technology for cost-effective international communications.

Others connect Digital equipment to IBM's SNA. More than just permitting communications, these gateways give your users direct access to both the batch and transaction processing environments of IBM mainframes.

Digital networking products dramatically enhance the effectiveness of your distributed computing resources. They can be combined in almost endless ways to build a network comprised of just two nodes, or over a thousand. Users in the next



cubicle or on another continent can share information, applications and peripherals. They can integrate work at any level. Smaller systems gain access to the powerful capabilities of centralized facilities. Large systems can off-load tasks to smaller dedicated systems.

DECnet software keeps Digital networking simple. Simplicity keeps Digital networking reliable.

SETTING THE NETWORK STANDARD FOR EASE OF USE.

Digital believes that excellence in networking is best measured from the user's point of view. And by and large, communications on a Digital network is just plain automatic.

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BEST ENGINEERED MEANS ENGINEERED TO A PLAN.

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EDITORIAL

Strung Out

Only one company has the chutzpah to announce cabling for its local-area network "two or three years" before it announces the actual network — IBM.

And only one company can string along potential users so cavalierly — IBM.

But just how much are users willing to put up with? Will they really tramp dutifully to one of the annointed IBM Cabling System outlets, buy up all the cable they won't be using fully for two or three years and then proceed to spend thousands of dollars wiring their buildings just in case IBM ever does introduce its long-awaited "data expressway"?

We've all heard the old saws about IBM creating de facto standards and legitimizing the marketplace with its divine presence. But in the case of the local-area network market, we're not talking about some budding new technology: We're talking about a fairly mature technology that has suffered the pains of infancy and moved on to adolescence, if not adulthood.

In many cases, local nets are no longer proprietary, accepting only one vendor's products. The proliferation of personal computers and office workstations has rendered that concept obsolete.

Furthermore, the cost of connecting nodes to local nets has dropped dramatically with the introduction of very large-scale integration (VLSI) technology. VLSI interfaces are cheaper and more easily mass-produced. And with hardware prices dropping continually from one generation to another, local nets can only become more affordable.

Given this fairly advanced state of local-area network technology and the substantial number of vendors offering it, we wouldn't be surprised if users who are ready to decide which local net to buy go ahead and do so. Why wait for something from IBM that may or may not ever appear?

Why has it taken IBM so long to perfect a local-area network? Software problems are the most likely explanation. Remember what IBM did with Mitel Corp., its abortive private branch exchange technology partner, when Mitel couldn't deliver its SX-2000 due to software snafus? IBM dropped Mitel like a hot potato.

Users may very well drop IBM and its Cabling System just as fast.

Talk Straight

Providing good corporate public relations is no easy task. The job calls for someone who can give out the proper information without disclosing anything proprietary and who can refer difficult questions to the right people in a company. Journalists recognize and appreciate good PR people when they see them. And in an industry where the public relations office is usually the first place reporters call for information, good PR people are invaluable. Those who know the most minute details of their companies and their products are a precious commodity, especially in a field as confusing as communications.

But their first allegiance is to their companies. And as a result, their answers to reporters' questions can sometimes be muddled. The PR person who responds to a specific question with a string of words that signify nothing can discourage even the most tolerant of reporters. Here is a typical nonanswer answer: "Our product is a totally integrated office solution with the flexibility to meet customer requirements and operate in a multitude of different environments for various business applications."

We don't mind one whit if they choose to wax poetic on the subject. But our point is this: With only so many hours in the day, reporters call vendors to get specific answers to specific questions on specific products. Convoluted language on top of complex subject matter is simply too much to bear. In extreme cases, it can lead to less coverage for certain vendors infamous for their vague answers to straightforward questions.

While we appreciate the constraints inherent in proprietary information, when no comment can be made, we would appreciate it more if the answer were a simple "No comment." And when a straight answer can be given, give it to us straight.

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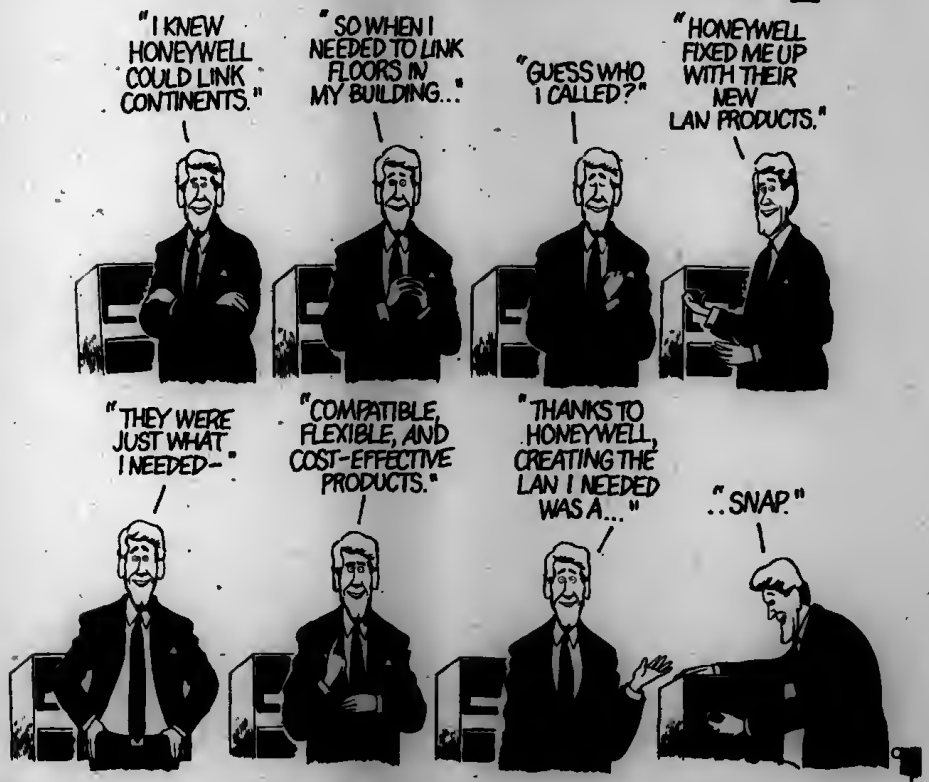

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Together, we can find the answers.

Honeywell

DIALOGUE

Should bypass carriers have to pay a fee to the local operating company?

Denise Ray, telecommunications manager, University of Maryland, College Park, Md.:

"It depends on if they are trying to make a profit. If you mean for common carrier, yes, then they should be charged a fee. But if it is an end user that has established or is building a bypass system, no, if it is only for that user's private use. A common carrier in the business of communications for profit should be charged a fee for reselling its services by using bypass technology. A private carrier — such as an end user with its own network, its own [private branch exchange] and other peripheral equipment that needs the system solely to service that company and not to make a profit — should not be charged."

Glen Josephson, communications manager, United Parcel Service, Paramus, N.J.:

"Yes. I guess after the divestiture, AT&T had taken such a beating, they deserve a little piece of the pie. That would at least be some kind of revenue that they could get out of it."

Steve Garber, network analyst, Communications Satellite Corp., Clarksburg, Md.:

"No, I don't think they should pay. To bypass, they evidently have to install their own equipment, so they are already paying for the facility to bypass. Why should they have to pay the telephone company? They're not using any of the the telephone company's facilities."

Barbara Harrelson, general telecommunications manager, Inmont Corp., Clifton, N.J.:

"If an independent company has totally built up its own network by bringing lines from an [MCI Communications Corp.] facility, for example, then it should be able to bypass without paying. If it opts to use the facilities that are already there, it should pay for their use."

Sam Hayburst, telecommunications manager, Varian Associates, Palo Alto, Calif.:

"No. The Bell operating companies want free enterprise, and I'd say that's free enterprise. I think that unless the bypassers can offer the service cost-efficiently, no one is going to use it anyway."

Annabel Dodd, telecommunications manager, Dennison Manufacturing Co., Framingham, Mass.:

"I think it is up to the Bell operating companies and the regulators to decide this issue. I also think the operating companies should have an incentive to be price-competitive so that people do not use the bypass technologies."

Terry Martin, technical systems and telecommunications director, Reynolds Metals Co., Richmond, Va.:

"No. The idea behind deregulation is to allow us to get the best 'bang for the buck' cost performance. Once you start violating that and watering it down with bypass fees, you end up back where you were before deregulation. Let's let free competition do its thing here."

LETTERS

Mending One's Ways

I am writing to you to express my appreciation for the truly fine work in *Computerworld On Communications.*

While traveling to the airport in Philadelphia recently, I overheard a woman mention *On Communications.* During the conversation that ensued, I was reminded that I seldom, if ever, have taken the time to express my appreciation for the things that make life more pleasant. It is the purpose of this letter to mend my ways.

Of all the various trade publications that I have read, *On Communications* stands out in quality and originality. The subjects are presented in a way that gives an understanding about their relationship to the whole of the telecommunications environment. For someone who dislikes reading as much as I do, they are a blessing.

Thank you and give my best to your associates, particularly to senior writer Katherine Hafner, whose work I have enjoyed.

Michael Hiles
Interand Corp.
Chicago, Ill.

Please Pass the PBX

Just finished reading the article "Please Pass the PBX" in your May 2 issue and found it to be the most comprehensive report to date on the subject of shared systems. Migs Damiani (my boss), Gaspar Martinez-Johnson and others share my opinion as well. Beautifully done, well-written, interesting and so on. What more can I say?

John D. Daly
Telecommunications Manager
Planning Research Corp.
McLean, Va.

Do You Remember?

My office thoroughly enjoyed your editorial in your May 2 issue on "Remember When . . ." but not for the reason you think. It was an excellent article, but should have been in the April 1 issue. I agree that today you may make three different calls to as many companies and get nowhere, but I fail to see the difference, other than it was one company before with the same results. I remember such responses as: "I'm sorry sir, but you need to call . . ."; "We can send a repairman next week"; "No one's working on your line," and then it fixes itself; and "We ran a tone test and everything is OK."

The best single summary statement I ever heard was: "You want to talk to someone stupid? Dial zero!"

I also recall in November 1979 when AT&T cut the land line trunk between Kansas City and New Jersey and switched to satellite without telling anyone. All 4,800 bit/sec dial-up communications died and then AT&T denied that anything had changed. The echo was so bad that 2780/3780 would not work. The solution, of course, was to transmit data to another city and have them forward it to New Jersey. What started as two places unable to communicate in late 1979 advanced to 15 by March 1980. All those places had been communicating successfully for at least a year prior to the no-change condition, and the "tone test" was still OK.

It was not uncommon to have a full-duplex dedicated line switch to simplex in the presence of a parked truck with a bell painted on the side. Inexplicably, the line started working just before the truck door closed. Also, any calls to Ma Bell were sure to inform you that your line was in perfect working order, and no one was working on your line.

The really amazing part is that I think you were serious and did not intend the entire editorial as a satire.

The best part of the divestiture is: "Even though the names will change, you'll still get the same great service."

The worst part is that they are right.

William J. Stadtherr
Systems Engineer
Overland Park, Kan.

On Communications welcomes letters from its readers. Letters should be typed, double-spaced and no longer than 150 words. They should be addressed to *Editor, Computerworld On Communications, 375 Cochituate Road, Box 880, Framingham, Mass. 01701.*

Correction

The identification of Bernard W. Bishop was inadvertantly omitted from "Please Pass the PBX" (May 2). Bishop is president of Electronic Office Centers of America, Inc., Schaumburg, Ill.

PRO & CON

The Battle for Interface Supremacy

The gulf of incompatibility is rapidly drying up in the face of advancing technology. Protocol converters or black boxes have brought systems compatibility closer to reality.

Over the past few months, the issue of computer-to-private branch exchange (PBX) communications has been thrust into the limelight. Two contenders are battling it out for interface supremacy. PBX maker Northern Telecom, Inc., in conjunction with computer maker Digital Equipment Corp., has developed the Computer-to-PBX Interface (CPI). CPI supporters include Data General Corp., Wang Laboratories, Inc., Prime Computers, Inc., Rolm Corp., Mitel Corp. and Intecom, Inc.

AT&T Information Systems has countered with its Digital Multiplexed Interface (DMI). DMI supporters include Wang and Data General Corp. (which are having it both ways), Hewlett-Packard Co. and Honeywell Information Systems, Inc.

In this month's "Pro and Con," the sponsors of CPI and DMI tout their respective interfaces.

ROSH CHRISTIAN

CPI

By Henry Theloosen

System integration will be vital to successful information management in the modern office environment. As a part of its ongoing Open World program, Northern Telecom, Inc. is actively seeking vendors of data processing and office systems that are willing to join forces in planning and developing integrated systems that use a variety of manufacturers' equipment to process and communicate data, text and voice electronically. The Computer-to-Private Branch Exchange (PBX) Interface (CPI), jointly developed by Northern Telecom and Digital Equipment Corp. under the Open World concept, is an important step toward these integrated systems.

CPI defines a standard, open specification for interconnecting PBXs and computers. This interface brings compatibility and provides substantial design flexibility for systems engineers and users. It makes possible the creation of a single system using equipment made by any or all of the manufacturers that support the CPI specifications.

"Agreement to use a common way to interconnect PBXs and computers is a major step for users," Peter C. Janka, DEC's marketing manager, said. "It gives them freedom to select the most appropriate products from both the PBX and computer industries, providing the most flexibility for change and growth and the lowest risk."

As of April 25, 1984, the companies that have publicly committed to incorporating CPI are: DEC; Data General Corp.; Wang Laboratories, Inc.; Prime Computers, Inc.; Rolm Corp.; Mitel Corp.; Incom, Inc. and Northern Telecom. Some 60 additional companies have executed licensing agreements, giving them the right to build CPI products. Licenses are available from Northern Telecom or DEC.

The CPI provides time-division multiplexing and switched access simultaneously between 24 terminals and a host computer. The interface is based on North American T-1 carrier specifications. Full-duplex communications between the CPI and the computer are provided over two twisted pairs of telephone wire. The line rate is 1.544M bit/sec. This equals a per-channel bit rate of 64K bit/sec for 24 channels, which is standard for a voice channel. However, the maximum data transmission rate is commonly 56K bit/sec per channel; therefore, the CPI reserves the extra bits for signaling and similar functions.

A strong advantage of the CPI is that only one circuit card is required to connect all 24 channels through Northern Telecom's SL-1 digital PBX to the computer. Earlier system designs required an

(Continued on Page 8)

Theloosen is director, product line management, Northern Telecom, Inc., Santa Clara, Calif.

DMI

By Pramode K. Verma

Since AT&T Information Systems introduced its Digital Multiplexed Interface (DMI) specification for an interface between a computer and a private branch exchange (PBX) in March, word of its benefits has spread rapidly. In fact, several data processing system and service suppliers have announced that they will support DMI — and we expect that the list of supporting vendors will continue to grow.

The positive response to DMI is not really surprising, since it meets several key telecommunications industry needs, which are interrelated. These benefits are listed below:

- DMI supports a transmission speed of 64K bit/sec, while providing protocols to support data transmission at all standard rates.
- DMI features common channel signaling.
- DMI can evolve easily to both North American and European integrated services digital network (ISDN) standards. In addition, the cost of interfacing a PBX to a host computer is greatly reduced by allowing as many as 23 terminals in the U.S. and Japan or 30 in Europe to connect simultaneously to a host computer.
- DMI is supported by high-speed driver and receiver devices from AT&T Technologies and multiplexer devices available from Rockwell International Corp. Standard available high-level data link control (HDLC) devices can also be used. The availability of DMI very large-scale integration (VLSI) devices is a major implementation advantage over other PBX-to-host interfaces. These devices, which will be available in 1985, are presently being designed by Rockwell International's Semiconductor Division to allow the direct presentation of DMI-transported data to host processor buses.

Clearly, systems compatibility is one of the most important issues facing the telecommunications industry and data systems vendors today. DMI's key benefit is that it is geared for systems compatibility now, as well as in the future.

This is achieved through its ability to support 64K bit/sec transmission over standard 1.544M bit/sec or T-1 facilities in the U.S. and 2.048M bit/sec facilities in Europe over two twisted pairs of wire. Initially, this feature might not appear to be important. But when we consider that the digital world is governed by the ISDN standard, which specifies 64K bit/sec transmission, the ability to support data transport at 64K bit/sec is obviously invaluable — and it sets DMI apart from other standards, which support maximum speeds of only 56K bit/sec.

Moreover, DMI eliminates distance limitations of the past. Previously, the host and the terminals had to be collocated to attain more than the typical 19.2K bit/sec speeds. DMI permits the 64K bit/sec transmission rate, whether the host is local or remote.

DMI also features common channel signaling. This results in an interface that has 23 data channels and one signaling channel in North America and Japan and 30 data channels plus a signaling channel and a framing channel in Europe. By multiplexing call set-up and tear-down information into one channel, the data flow on the other 30 channels is totally unencumbered.

Certainly not the least important consideration is that the cost of interfacing a PBX to a host is greatly reduced through this multiplexed arrangement of multiple terminals connected to a host computer over two twisted pairs.

Especially in today's highly competitive marketplace, data systems vendors recognize the need to make their systems more attractive by enhancing their compatibility. To a major extent, that compatibility depends on the interface board, which connects the two twisted pairs of wires, the

(Continued on Page 9)

Verma is DMI product manager, AT&T Information Systems, Morristown, N.J.

CPI *(From Page 7)*
individual digital access module circuit card per channel. The CPI approach can provide cost reductions of up to 65%.

An important companion to the CPI is the Digital Trunk Interface (DTI) developed by Northern Telecom. The DTI provides an interface between an SL-1 business communications system and a common carrier T-1 trunk or any other T-1 digital transmission facility. Where T-1 facilities are available, this feature allows the SL-1 system to transmit and receive both voice and data signals over the switched telephone network.

Whether it represents voice or data, a bit is a bit as far as the T-1 carrier is concerned. All that is required is that the signals use the T-1 format and protocol. An SL-1 system, equipped with CPI and DTI cards, would be a valuable addition to the communications facilities of any business, medical center, college campus or military installation requiring numerous voice and data transmission lines.

The ability to switch both voice and data over the same lines dramatically increases line efficiency and obviates the need for additional cabling. An SL-1 installation offers an attractive alternative to extensive new transmission paths or a local-area network dedicated exclusively to data transmission.

Furthermore, the SL-1, in combination with the CPI and DTI, ensures that transmitted and received signals will be of network quality and level. Also, the reliability of PBX switching and telephone transmission equipment has been proven in thousands of hours of field operations.

Not only is the PBX the most reliable piece of equipment in the office, it is also the most cost-effective distribution mechanism in terms of materials and installation costs. Furthermore, PBXs provide the only networks that support voice communications, data communications and switching.

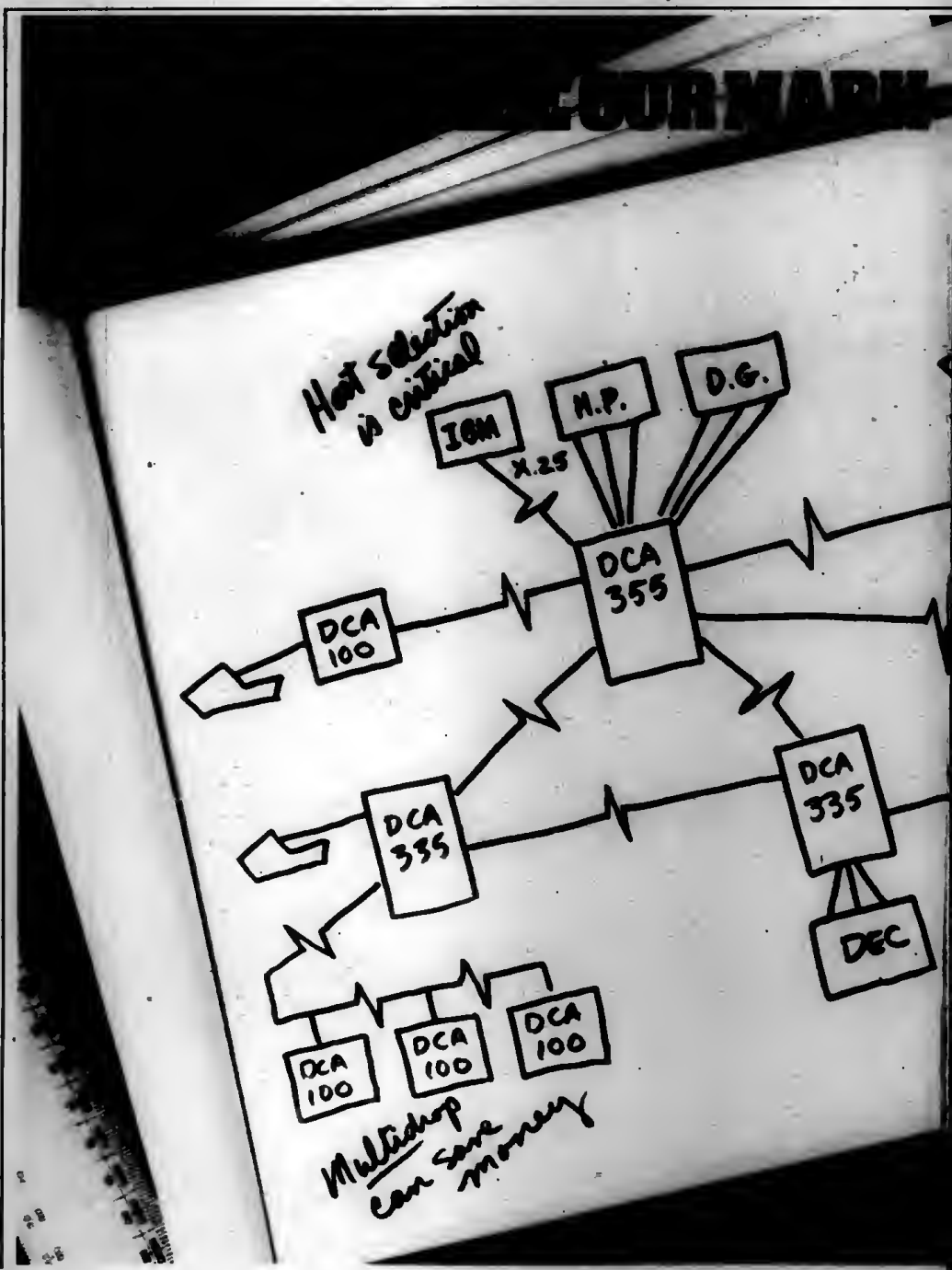
The telephone cable these networks use for distribution has already been installed in 95% of the offices in North America. A suitable PBX, such as the SL-1, can turn this wiring into an information pipeline capable of carrying voice, data, text and image. And the intelligence of the voice, switching and data processing subsystems can be linked to enhance the performance of each service.

Another advantage of PBXs is their modular construction. This means that only immediately required services need be provided for at the time of installation. Future expansion and modification can be readily accomplished to meet changing needs. This work can almost always be accomplished without interrupting existing services.

Public policy also influences the trend toward integrated networks. By recognizing advances in technology, this policy is encouraging the integration of telecommunications and computer technology, as evidenced by the results of the Federal Communication Commission's Computer Inquiries.

The telecommunications industry has recognized this trend and established a goal of creating a universal network capable of transmitting virtually any kind of communications traffic. This concept is called the integrated services digital network (ISDN).

Northern Telecom's Open World program, including the CPI and DTI, is fully compatible with the ISDN. In fact, Open World extends ISDN right to the user's workstation. As market forces, advancing technology and public policy continue to foster the establishment of the universal telecommunications network, Open World will play an ever more important role.



DMI *(From Page 7)*

T-1 line, from the terminals to their computer.

Last fall, AT&T Information Systems announced agreements with Hewlett-Packard Co. and Wang Laboratories, Inc. to work toward interfacing their product lines. The agreement included plans to use an AT&T Information Systems DMI to link the company's Dimension System 85 digital PBX with the other companies' data processing and office automation equipment to provide cost-effective, flexible digital switch-to-processor interfaces. AT&T Information Systems also certified that their equipment, with the interfaces, could be used with System 85.

Users of the HP 3000 line of host processors will be able to communicate with System 85 and associated data terminals from HP, AT&T Information Systems and others. DMI also allows program downloads and file exchange to HP's 150 Personal Computer from locally or remotely attached 3000 series host processors.

Wang products, such as the OIS and VS lines of minicomputers, can communicate through DMI and System 85 to Wang's line of clustered word processing systems and the Wang Professional Computer. Moreover, as a licensee of Wang's Document Communication specifications, AT&T Information Systems can convert Wang documents to be edited and mailed electronically within their System 85 Electronic Document Communication service.

DMI similarly can be used with AT&T Information Systems' recently announced System 75, which combines voice, high-speed data and an array of communications and system management features into a single integrated system for installations of 300-plus lines.

DMI has continued to gather speed and support in the marketplace. In March, AT&T Information Systems announced that Honeywell Information Systems, Inc. and Data General Corp. will support DMI, further enhancing its position both nationally and internationally as a standard interface.

Also in March, Rockwell International's Semiconductor Division signed an agreement with AT&T Information Systems to develop and manufacture VLSI devices for DMI. Rockwell International intends to make the devices generally available for implementation.

To support the implementation of DMI further, AT&T Technologies has released several key components from T-1 technology to DMI licensees to implement the standard. As these components already are siliconized, they also offer attractive cost benefits to manufacturers. Devices available from Rockwell International and other semiconductor suppliers for multiplexing and HDLC protocol handling can be used for immediate DMI implementation.

AT&T Information Systems sponsors a users group for DMI licensees to expedite and support the DMI implementation from both the PBX and host perspectives.

Our objective is to open efficient interfaces to our advanced systems, to make DMI a public interface — an industry standard — and to work closely with vendors in the information marketplace to help define a universal interface for their equipment to our systems. Obviously, compatibility is to the advantage of all the involved companies and their customers.

We see our agreements with data systems vendors as logical extensions of their overall networking strategy, as DMI provides a vital link for workstations and computers that results in enhanced capabilities and reduced communications costs for office networks.

NEWS ANALYSIS

AT&T to Cut Rates 6.1%

Both AT&T and its long-distance rivals can claim victory after the Federal Communications Commission (FCC) ordered AT&T to cut its long-distance rates by 6.1%. It was the first such order from the FCC in 14 years and is expected to save consumers $1.7 billion annually in the $42-billion-a-year long-distance industry.

AT&T is happy because the reduced long-distance rates — also applicable to Wats — will put pressure on competitors like MCI Communications Corp. and GTE-Sprint Communications Corp. to slash their prices. (Anticipating the order, MCI cut its fixed monthly fees for full day and nighttime service a week earlier.)

AT&T is also pleased because the FCC gave it permission to charge 50 cents for each long-distance directory assistance call made monthly. However, the first two such calls will be free.

MCI and GTE-Sprint can take hope of their own from the FCC edict because it mandated an 8.5% cut in access fees paid to the local phone companies for access to long-distance lines. The FCC said that AT&T's competitors such as MCI and GTE-Sprint will continue to pay up to 55% less for access.

Moreover, MCI, GTE-Sprint and others can breathe a sigh of relief because AT&T was not allowed to cut long-distance rates by 10.5%, which would have really put the pressure on them.

All this is just the beginning, if FCC Chairman Mark Fowler is to have his way. In the wake of the order, which took effect May 25, he voiced his hope that long-distance rates will be reduced 35% to 40% over the next two to three years. Imagine how a fully deregulated AT&T Communications would thrive in that environment.

Big Blue's Dance

In its own Dance of the Seven Veils, IBM is laying the foundation for its much-anticipated, token-ring local-area network. Last month, Big Blue announced its IBM Cabling System, a proprietary wiring scheme installed in a building. The principal medium to be used in the system is twisted pair with the possibility of adding fiber-optic cable. The system, which allows office machinery to be plugged into the wall much like a telephone, will serve as the wiring requirement for the IBM local-area network.

At the same time, to the chagrin of its users and the delight of its competition, IBM issued an "intent to implement in two to three years a local-area network." Wiring, which has been called the pick-and-shovel part of networking technology, is now the key, with IBM's approach.

In its dance around local net development, IBM is dropping one veil at a time for two reasons: to discourage those waiting for the network from buying a competitor's system and to give IBM time to get its own pieces of the puzzle together. It is rumored that IBM is having trouble with the microchips from Texas Instruments, Inc. for the network hardware. Whatever the results of the announcement, its implications are clear: IBM believes it can maintain a stranglehold on the local network industry without even offering a product.

OCC Survival Strategy

United Telecommunications, Inc. announced in April that it plans to construct its own nationwide long-distance network to carry everything from slow-speed data to high-speed data and voice transmission. The $2-billion, all-digital, fiber-optic system is scheduled for completion by 1987, with enhancements through 1994 to cost another $2 billion. Motivated by the recognition that owning one's own network is an essential ingredient for survival these days, United Telecom and others are planning to cover the nation with their own transmission facilities.

Equally gargantuan are the budgets of such other common carriers as MCI Communications Corp. and GTE-Sprint Communications Corp., which plan to spend over $1 billion each for new capacity. According to Lawrence Garfinkel, AT&T's vice-president of service management, the other common carriers' combined construction budgets are projected to account for over three-fourths of total industry construction in 1984.

The rush among the other common carriers to build new capacity is largely due to the fact that despite all the problems AT&T Communications' customers are having, the other common carriers simply do not have the network capacity to take on AT&T defectors. GTE-Sprint, in fact, was so short of space it was forced recently to stop adding customers in 35 to 40 large municipalities. For now, the game is catch-up, but sooner or later the question could become one of too much capacity. That is, if MCI and all the rest are building such comprehensive networks, will there be enough traffic to fill the available capacity?

Waiver Requests Filed

The regional Bell operating companies are attempting to enter markets other than those designated in the 1982 AT&T Consent Decree. To date, the regional operating companies have filed about eight waiver requests with U.S. Federal District Court Judge Harold Greene, requesting that they be allowed to enter such markets as long-distance and real estate in order to be effective competitors, respond better to customer needs and provide "total solutions" for their customers.

The Justice Department, the other common carriers and the International Communications Association are none too pleased with the prospect of local telephone companies entering new and different markets because it could mean compromising the quality of their primary purpose as local exchange carriers. That is, if the Bell operating companies become too involved in other lines of business, they may end up subsidizing the ventures with capital from their exchange businesses.

At this point, it is anyone's guess what Judge Greene's action on the matter will be. Some suggest he will throw out the requests summarily and tell them to stick to their knitting. Others — notably the Bell operating companies — are more optimistic.

New Kid on the Block

AT&T Information Systems announced in April its System 75 private branch exchange, the little brother to the System 85 announced in January 1983. Nonblocking for 236 of its 300 lines for simultaneous two-way conversations, the System 75 transmits data at speeds from 19.2K bit/sec to 64K bit/sec using AT&T's 515 Business Communications Terminal. The switch costs from $600 to $900 per line, depending on the number of lines and the variety of telephones used. It will be available on a limited basis in the third quarter of this year, with general availability in the fourth quarter. But if AT&T's difficulties in delivering its System 85 are any indication, users may be in for a longer wait.

The introduction comes at a time when AT&T Information Systems is losing droves of customers each month to competitors, and the System 75 could be a make-or-break product for the fledgling company.

Wang, Intecom Ink Pact

Wang Laboratories, Inc. and Intecom, Inc. announced an agreement in principle whereby Wang will immediately purchase five million shares of Intecom stock for $22.5 million and buy an additional 3.5 million shares over the next year. The purchase is said to equal 15% of the high-flying, private branch exchange (PBX) vendor's total stock, and the agreed limit of total ownership is 30%.

The deal calls for development of an interface between Wang computer systems and Intecom's Integrated Business Exchange that will make the two systems compatible. It culminates months of speculation over Wang's future PBX plans. Wang recently scrapped its own PBX development plans, which one Wang official called a "redirection" of effort. The Wang-Intecom pact smacks of the deal struck between IBM and Rolm Corp. a year ago. It should mean a healthy influx of funds for Intecom's R&D plans.

RBOCs Up, AT&T Down

As AT&T's earnings dipped well below projections, the regional Bell holding companies reported first-quarter earnings that were much better than expected. In fact, Ameritech, Bell Atlantic and BellSouth surpassed AT&T's $227 million net income. Ameritech's earnings were $257.6 million, or $2.66 per share on operating revenue of $2.03 billion. Bell Atlantic earned $235.4 million, or $2.44 per share on operating revenue of $1.96 billion, and BellSouth made $270.4 million, or $2.80 per share on $2.3 total revenue. All seven companies exceeded analysts' expectations for first-quarter earnings.

One possible explanation for the financial robustness of the operating companies is the reduction in employees and use of advanced technology to contain costs. The rest of the year will depend largely on regulatory action. In the meantime, Charles Brown, AT&T chief executive officer and chairman, attributed AT&T's disappointing first quarter to new billing and accounting procedures and a morass of regulation.

Equality At Last

On July 15, equal access will have its first try in Charleston, W. Va., where residents will be asked to choose their primary common carrier. MCI Communications Corp. and AT&T Communications promise to compete most fiercely to gain subscribers to the higher quality interconnect lines.

While equal access will improve the quality of lines made available to the other common carriers and erase inconvenient dialing requirements, such carriers as MCI Communications Corp. will lose the price advantage that has attracted their customers in the past. MCI has said that it does not plan to raise its rates and recently announced plans to drop its monthly service charge, coincidentally, on July 15.

As soon as MCI's customer base has been significantly augmented, and customers face as much as a $40 charge to change carriers again, MCI's rates may rise. MCI and AT&T are both planning advertising blitzes and incentives such as 60 minutes of free long-distance service. The transition to equal access throughout the rest of the U.S. is expected to occur over the next two years, and by September 1986, about 80% of the country will have equal access.

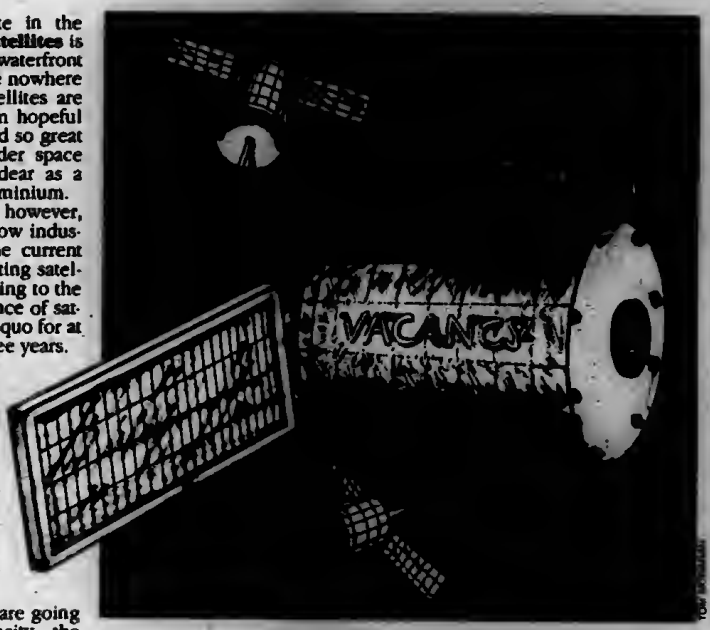
Eight carriers will compete in Charleston: GTE-Sprint Communications Corp.; Satellite Business Systems; Skyline; Long Distance Telephone Savers, Inc.; Satelco; Call U.S., Inc.; AT&T Communications; and MCI.

KATHERINE HAFNER

Plenty of Room to Let?

Like Florida real estate in the 1920s, the market for **satellites** is wide open. And, just as waterfront properties in Florida are nowhere to be had in 1984, satellites are being launched today in hopeful anticipation of a demand so great that available transponder space will eventually be as dear as a West Palm Beach condominium.

In the meantime, however, "transponder glut" is how industry pundits describe the current state of the ever-fluctuating satellite market. And, according to the experts, an overabundance of satellites will be the status quo for at least the next two to three years.



"Right now there are sufficient satellites up there with sufficient capacity," were the careful words of Joseph Harcarufka, an engineer at the Federal Communications Commission. "If you want to buy a transponder today, there's no shortage. And in the coming year, there will be additional capacity because more satellites are going up. So with all that capacity, the question is, 'Who's going to use it?' To be truthful, I don't know."

Some satellite experts believe that with the widespread use of such new technologies as video teleconferencing, the market for transponder space will become increasingly competitive.

"The kind of speculation that's going on now is the same type of speculation that went on in the personal computer market two years ago, or oil drilling before that," Harcarufka said. "Since the orbit is defined and is a limited resource, lots of people are hurrying to get their satellites up there."

As long as satellites float around on the orbital arc with unused transponders, the cost to the satellite vendor mounts. It takes about $100 million and three to five years to construct and launch a satellite.

RCA American Communications, Inc., which owns and operates the Satcom satellite system, launched its Satcom 2R last September to replace an old satellite and plans to launch three Ku-band satellites and one C-band satellite between now and 1987.

"We find it difficult to say there is transponder glut. People are launching them now because they see there are only so many slots up there," John Williamson, an RCA spokesman, said. "Our business is doing quite well. Some of the transponders we had leased aren't being used, and others that aren't being used are spoken for.

"In the long run, we're very bullish on the market," Williamson said. "Certainly, [the AT&T] divestiture is going to open up new opportunities. You're almost limited just by your imagination, as long as you can find a niche where it's needed."

According to Polly Rash, marketing manager at SatServ in Washington, D.C., after the transponder market tightens, advancements in technology will cause it to open up once again. "Although the orbital arc is a non-renewable resource, technology can be used to divide it more efficiently," she said. "And new technologies, such as space platforms and collocation of satellites operating at different frequencies in the same orbital slots, will loosen up the market again."

"I saw the handwriting on the wall," noted one 29-year-old AT&T Information Systems employee, who rose three levels from account executive to staff manager in 18 months.

For all its casualties, the AT&T divestiture has also produced its share of beneficiaries. Many **AT&T employees** who were sitting in a rut before the breakup suddenly found themselves in a position of unlimited potential.

"Normally it would have taken three to five years to do what I did in a year and a half," the same manager said. "In the vacuum created by the divestiture, you can propose ideas and be promoted on the merits of those ideas. The corporation provides great opportunities for those who are willing to take risks."

AT&T refuses to comment specifically on employment opportunities that have resulted from divestiture. "We had some exciting career opportunities that existed before the divestiture, and we have exciting career opportunities now," an AT&T spokesman noted. Nevertheless, the tales of success often speak for themselves.

"I literally rose from the manholes, where I was a cable splicer, to a $50,000 job with AT&T Information Systems as a staff manager in charge of all technical support," said one 25-year veteran.

"Each point in the divestiture has been beneficial to me," he said. "I'm no genius. I'm an electrician by trade. My strong point is just in being resourceful, and the company has rewarded me."

Opportunities also appear to be ripe for people interested in switching their focus to fields hitherto de-emphasized at AT&T.

"I was at [AT&T] Long Lines for 20 years and then became interested in computers," said Howard Holden, a 43-year-old technical consultant at AT&T Information Systems in Independence, Ohio. "I heard last year that we were contemplating announcing computers, so I've ended up here.

"There's a good deal of responsibility laying around to be assumed," Holden continued. "If you're willing to take risks, then you'll benefit. I'm really a traditionalist, but in the last two years I've become a risk-taker. And I've met a lot of people who are in the same position as I. That is, people who really saw a chance to break out of the mold."

Node. Webster's calls it "an entangling complication," a "thickened or swollen enlargement" or "a point at which subsidiary parts originate or center."

This is no static industry, and its players are not timid about creating definitions to fit the concept at hand. For communications types, "node" has as many definitions as the old woman in the shoe has children. We asked a few specialists to define the word:

Edward Horrell, president, Mitchell and Horrell, Inc., Memphis, Tenn.:

"If you ask a dozen different people, you're going to get a dozen different concepts. A node implies to me the capability of standalone switching, or processing, normally in tandem with another switch or processor."

George Colony, president, Forrester Research, Inc., Cambridge, Mass.:

"What is a node? Nodes are things that teenagers get on their faces when they eat too much chocolate. Seriously. What is a node? Maybe a good generic definition is that it is, I don't want to say a place, but it is a portion of the network within which a signal is treated or processed. The term node means everything from a satellite earth station to a front-end processor."

H. Paris Burstyn, Arthur D. Little Decision Resources, Cambridge, Mass.:

"I would just call it a switching center in a communications network, such as a central office, or the site of a communications concentrator for a value-added network. That's what I would think of a node as being: the place where all the data gets switched around and shunted back and forth."

Linda Palumbo, district manager, Bell Communications Research, Inc., Livingston, N.J.:

"Whenever I hear the word node, I think of a switching location within a network architecture. When analyzing an architecture in a generic sense, I like to refer to the switching points as nodes and the transmission facilities as links."

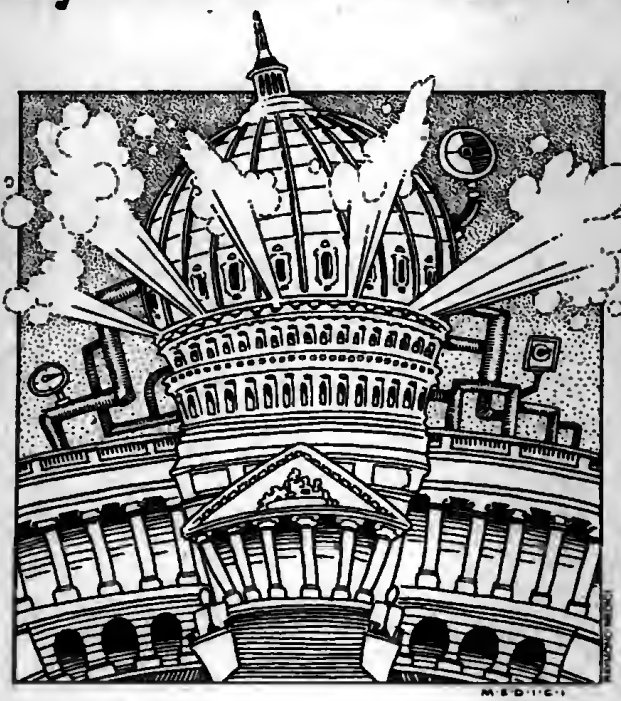
Gary Audin, president, Delphi, Inc., Pompton Lakes, N.J.:

"People put in nodes of all sorts of descriptions, just as people say front end when it's doing no front-end work at all, when it's really an adapter. I've seen some people call a terminal a node. And the way I use it, terminals are terminals. A front end would be equivalent to a node. Alternately, some people call a node something that is not an originator of data. Some people would put down nodes as originators. You could even look at a cluster controller or terminal controller as being a node as well. It is not clear."

Hafner is senior writer for Computerworld On Communications.

ALAN PEARCE

Plenty to Get Steamed About



It is clear that the birth of competition in the telecommunications-information industry will be long and difficult.

A list of the 14 major policy squabbles currently facing the Federal Communications Commission (FCC), the states, Congress, the Justice Department and the courts graphically illustrates the chaos that afflicts the telecommunications industry:

1. The threat that competition poses to universal service, lifeline services and telephone companies serving high-cost rural areas. These issues are being tackled mainly by the FCC and the state regulators, but are also of vital concern to Congress.

2. The problem of equal interconnection for all interexchange carriers. Equal interconnection is a priority for the so-called other common carriers and, of course, for the local telephone companies, which have to upgrade their plant to give equal access to all.

Equal interconnection, as a policy, appears to be the shared responsibility of the FCC, the state regulators, the Justice Department and U.S. Federal District Court Judge Harold Greene, who is overseeing AT&T divestiture.

3. The local telephone bypass controversy. The issue of local bypass threatens not only the concept of universal service, but also the viability of local telephone companies. The bypass issue is the major focus of an investigation by the FCC, which will make a report to Congress before the end of the year. It must also be addressed by state regulatory authorities.

4. Implementation of the new tariffs brought on by the AT&T divestiture and the introduction of competition in the long-haul telecommunications services market. The postdivestiture tariffs are causing controversy and confusion for everyone.

5. Network standards and equipment specification requirements. These are causing headaches not only for the telephone companies and the equipment manufacturers, but also for major customers of the telephone network. In the so-called deregulatory environment, few policymakers have an interest in standards.

6. The surprise rate of return investigation. Currently, much of the established telephone industry, including AT&T, is allowed up to 12¾% rate of return on its rate base. This return — established by the FCC in 1981 — enables the telephone industry to reduce its risks and borrow money at low-risk rates, unlike companies in a highly competitive environment that must pay a risk premium. The telephone industry was delivered a major blow, however, when the FCC casually suggested that the rate of return for AT&T Communications might be "too high." Any attempt to reduce AT&T's rate of return would adversely affect the financial positions of many local telephone companies. According to the FCC, this may be the price that has to be paid in establishing a more competitive environment.

7. Jurisdictional issues. Such issues pose serious threats to the establishment of policy harmony between state regulators and the FCC. This will probably have to be resolved by Congress. Until Congress acts, however, telecommunications policymaking among the states and between the states and the FCC will continue to diverge, causing further disarray.

8. The impact of competition on local rates. The states claim that competition massively increases local rates. The FCC dismisses this argument and says that competition ought to bring benefits to all — eventually. Clearly, this is a controversy that affects everyone; Congress has demonstrated its concern by publishing several reports and holding hearings. More reports and more hearings are guaranteed. Congress has also ordered the FCC to monitor local rate increases. Meanwhile, the states are in the direct firing line, as they struggle with the biggest rate-increase requests in the history of the industry.

9. The long-term deregulation of AT&T. Clearly, AT&T Communications wants to be given the same operating flexibility as its competitors, but because of its great size, this is unlikely to happen soon. Nevertheless, the deregulatory effort continues in Washington, and AT&T might get some early relief.

10. Proposed revisions to the FCC's Second Computer Inquiry decision that currently restricts Bell operating companies from offering enhanced services and perhaps even the equipment that goes along with those services. The operating companies are determined to win more operating flexibility for themselves.

11. Proposed revisions to the Modified Final Judgment in the AT&T case. Judge Greene has already heard oral arguments on whether to allow the recently divested Bell operating companies to enter newly emerging segments of the telecommunications-information industry. The seven regional Bell operating companies want to diversify by offering other services. However, they must get Judge Greene's permission or, failing that, seek legislative relief from the restrictions of the Modified Final Judgment.

12. How to deal with intra-local access and transport area (Lata) competition. A major issue concerns whether to extend competition to intraLata toll services. This battle is being waged at the state level. Only five states — New York, Texas, Maryland, Ohio and Florida — have approved intraLata toll competition. Most of the other 45 are believed to be veering against it, but inquiries are under way in many states.

13. Questions involving telecommunications equipment and international trade. These questions are currently being debated before Congress, the International Trade Commission, the Trade Representatives Office and the Departments of State, Commerce and Defense. There is a growing fear in Washington, D.C., that the manufacturers in Japan and elsewhere may dominate many aspects of the telecommunications equipment market. What can be done about it? Senator John Danforth (R-Mo.) has introduced a bill calling for the imposition of an import duty on certain imported telecommunications equipment in order to protect U.S. manufacturers. Meanwhile, the International Trade Commission is holding hearings on the status of the U.S. and foreign telecommunications equipment industry.

14. The FCC inquiry that is attempting to establish whether domestic procompetitive and deregulatory policies can be promoted internationally. The inquiry focuses on whether new international carriers can begin to develop their own international satellite systems to compete with Intelsat and Communications Satellite Corp. This kind of unilateral inquiry by the FCC, without taking into account the concerns of our partners in the international telecommunications system, often disturbs global alliance. This alliance is essential if uninterrupted communications among nation states is to continue. As a result of the involvement of the Departments of State, Commerce and Defense in international telecommunications policy issues, it is likely that Congress will try to establish a uniform international policy concerning telecommunications services and equipment.

These are the major issues that confront policymakers. Unfortunately, listing them is far easier than satisfactorily resolving them.

In an area as complex and dynamic as telecommunications, it is often difficult to promote policies and legislation as a remedy for specific problems emerging from deregulation and the growth of competition. Nevertheless, the policy debate must continue at all levels. And if the industry is to prosper, the policies must be developed quickly.

If our policymakers fail to develop clear new policy guidelines, then we all lose. It is vital for all interested parties to take part in the debate. In the end, however, once the democratic debate is over, our policymakers and elected officials make these unilateral decisions. The rest of us have to live — or die — by them.

Pearce is president of Information Age Economics, Inc., Washington, D.C., and a regular columnist with Computerworld On Communications.

THE MULTIFARIOUS NEW EMPIRE OF CINCINNATI BELL

BY KATHERINE HAFNER

CINCINNATI — Cincinnati Bell, Inc., the telephone company serving the greater Cincinnati area, is enjoying the fruits of divestiture as only one other phone company — Southern New England Telephone (Snet) — can. By virtue of the fact that AT&T owned a minority share of stock in them before it spun off its operating companies, the two companies have had no constraints placed on them. That is, they are free to market whatever they please to whomever they please wherever they please.

Hafner is senior writer for Computerworld On Communications.

Before the divestiture, Cincinnati Bell was the seventh largest telephone company in the country. Today, it is the 14th largest. "We haven't changed. The world has changed," said Dennis J. Sullivan, executive vice-president of Cincinnati Bell Telephone, one of the Cincinnati Bell subsidiaries. With 4,500 employees, Cincinnati Bell Telephone serves 1.5 million people in an area 50 miles in radius.

In all the media uproar surrounding the divestiture, the lack of attention paid Cincinnati Bell is largely due to its elusive identity. Is it an independent telephone company, like the other 1,400 independent telephone companies in the U.S. that we hear so little about? Or, because of AT&T's partial ownership of the company, could it be considered a local operating company? Cincinnati Bell, it seems, prefers to style itself somewhere in between, as a company deftly switching from one persona to the other in order to benefit from whatever set of rules fits the situation at hand.

To appreciate the degree of freedom that Cincinnati Bell and Snet have been given, consider the predicament of the other local operating companies: Under the terms of the ▶

PHOTO © 1984 SHERMAN GRINBERG

Cincinnati Bell

Modified Final Judgment, which settled the Department of Justice's antitrust case against AT&T, the Bell operating companies can only provide local service. And under the Federal Communication Commission's (FCC) 1980 Second Computer Inquiry, as of Jan. 1, 1983, embedded customer premises equipment is now the property of AT&T, and the local operating companies are allowed to sell new customer premises equipment only via a separate subsidiary. In addition, in order that they not be diverted from their obligation to provide basic telephone service, the operating companies cannot enter any markets other than those designated in the AT&T Consent Decree. Cincinnati Bell and Snet are exempt from all of those restrictions. That is, if so inclined, the two companies could set up a long-distance network blanketing North America. They could even manufacture their own equipment. Or, if the communications industry should ever hit on hard times, they could depart entirely and, say, build microcomputers.

Snet, whose domain is Connecticut for strict telephone service but anywhere else for other products, has attacked the market with a vengeance. Over a year ago, Snet formed a separate division to sell complete office systems through OEM agreements and also announced an agreement with CSX Corp. to develop a fiber-optic network in the Southeastern U.S. Cincinnati Bell's approach, on the other hand, is largely conservative: The company is treading lightly into the software market and slowly establishing separate subsidiaries that address such diverse markets as cellular radio and material recycling.

As it takes its first tentative steps into the burgeoning telecommunications market, Cincinnati Bell has so far chosen to maintain a low profile. In contrast to Snet, for whom publicity has been in no short supply, Cincinnati Bell has chosen to keep advertising and other efforts at public exposure to a minimum.

"We're two different companies, and we have different kinds of objectives, along with different kinds of market opportunities," Sullivan said. "Snet has chosen to publicize a lot of the things it is getting into. And we're taking the course of only talking about things we've already gotten into."

For a company that brands itself as one to "err on the side of understatement," Cincinnati Bell is already setting some bold goals. Before divestiture, AT&T owned 33% of Cincinnati Bell's stock; in January, the company repurchased 17% of the stock and plans to regain the remaining 16% over the next five years. Revenues in 1983 were $500 million, a 7.7% increase over the year before. Sullivan has announced publicly that by 1988, subsidiaries other than the phone company will produce 25% of Cincinnati Bell's net income. "That's an ambitious goal," Sullivan explained, "because we expect the phone company to grow, too."

The largest of the subsidiaries is Cincinnati Bell Information Systems, Inc. (CBIS), which was formed in August 1983 to sell software packages to other phone companies throughout the world. The CBIS products, most of them written in Cobol for IBM's IMS data base management system, are designed specifically for telephone companies. They include a records information system for customer accounts, a message processing system for billing and a customer cable record for monitoring cable facilities.

So far, CBIS' largest customer is none other than Cincinnati Bell Telephone: The company claims to have marketing plans that would bring into the fold customers from as far away as Australia.

Cincinnati Bell Information Systems President John T. LaMacchia

So far, CBIS' largest customer is none other than Cincinnati Bell Telephone: The company claims to have aggressive marketing plans in the works that would bring into the fold customers from as far away as Australia. Currently staffed at 260, by the end of the year, CBIS will employ 300, according to John T. LaMacchia, president of CBIS. CBIS also plans to depart from its Cobol emphasis and start developing software packages in C language for the Bell Laboratories Unix operating system.

The company's shift to an AT&T orientation is consonant with a measured strategy of continued business agreements with AT&T that include contracted services from Bell Communications Research, Inc., the operating companies' counterpart to Bell Labs, and the value-added reselling of AT&T's 3B line of computers.

"But we're not exclusively tied to AT&T," Sullivan pointed out. "We're dealing with them because they're good, not because we have any great obligation. We're trying to cultivate business with them and with others."

The new subsidiary's biggest challenge is to penetrate the customized software market enough to displace existing "homegrown" accounting, billing and records systems that independent telephone companies have had in place for years.

"I think there is a very broad market out there," Sullivan said. "The burden that John [LaMacchia] has is to convince customers that putting the new software in is going to displace sufficient costs to warrant doing it, that it is going to boost their productivity in such a way that they are better off. Because if you don't have a new generation that can enhance the operations of a customer, the customer will say, 'Thanks, but no thanks.' "

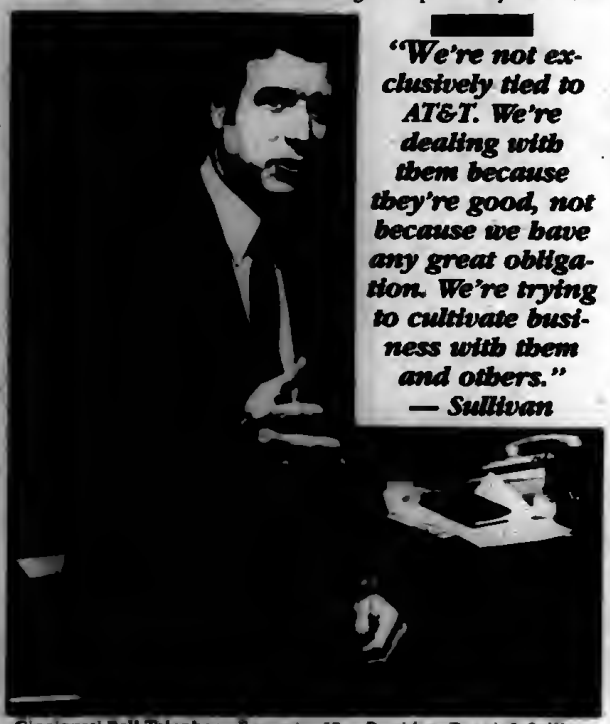
While CBIS is certainly the largest subsidiary with the most to risk, there is a long list of others: Cincinnati Bell Cellular Systems, a partnership with the Ameritech regional operating company to provide cellular mobile phone service in the Cincinnati area; Cincinnati Bell Supply, a joint venture with Anixter Brothers, Inc., a distributor of communications equipment; Material Recycling Co., to recycle and reclaim obsolete telephone equipment; and ComQuest, a business that will offer Cincinnati as a beta test site for others' new products.

"ComQuest is open to testing anybody's products," Sullivan said. "We are already testing AT&T's card caller at the airport here. It's the first introduction of the product in the country."

And Cincinnati Bell's most recently formed subsidiary, to be launched July 1, is a long-distance reseller. Cincinnati Bell Long Distance, Inc. will lease such facilities from interstate carriers as Wats and private lines and sell them to long-distance customers at "competitive prices."

To manage these changes, last year, the company brought in Sullivan and LaMacchia, two AT&T veterans who claim to recognize a

"We're not exclusively tied to AT&T. We're dealing with them because they're good, not because we have any great obligation. We're trying to cultivate business with them and others."
— Sullivan



Cincinnati Bell Telephone Executive Vice-President Dennis J. Sullivan

good thing when they see it.

"I came here because Cincinnati Bell is one of the few companies that is going to be able to function in the future by retaining all the good things it had done in the past and is still free to move out into new ventures," explained Sullivan, who moved from New Jersey to take the job. "I don't think there's another company in the U.S. that is quite so situated."

Sullivan's strategy for orderly growth includes a series of seminars sponsored by the company for all its employees. According to Sullivan, the seminars are to become "a way of life, as a means of helping the communication in the company." In instituting the seminars, Sullivan said, "we had to review our culture. And the bottom line turned out to be participative management. You can still have a hierarchy, but you listen to people. What they say counts."

Bypass is "a buzzword for competition. It simply says a customer will sense there is greater value by providing his own communications as opposed to using ours."

Out of the first seminar in October, which Sullivan ran personally, the group came up with "11 major issues the company needed to pursue, and we assigned task forces of people to make several fundamental changes," Sullivan said. In addition, employees will be paid anywhere from $50 to $5,000 for valuable new ideas. "That's not terribly original," Sullivan conceded. "But it's terribly effective."

Much of Cincinnati Bell's advantageous position as a local exchange carrier has less to do with court orders than geographics. While it has to provide service for the occasional rural area, its customer base is mostly urban and therefore less of an overhead strain than a service area with a large number of isolated residences.

"We do serve six counties of Kentucky that are rural, and any rural service is costly because you're running facilities out a long way," Sullivan said. "We use average pricing, which means the person next to the central office is probably paying a lot more than the person who lives at the edge of the area."

Despite its entrenchment in Cincinnati, the telephone company is still threatened by the fact that its large corporate customers can and do bypass the local loop for certain communications routes. Proctor and Gamble Co., for instance, which is Cincinnati Bell's largest customer, still uses the local phone company for much of its telephone service and its access to long-distance lines, but also operates its own microwave network for most of its transmission to different Proctor and Gamble buildings throughout the Cincinnati area. And Federated Department Stores, which also has its corporate headquarters in Cincinnati, is considering installing an in-house network as well.

Bypass "is a very clear concern of ours for the future," acknowledged Cincinnati Bell President Dwight H. Hibbard recently at the company's annual shareholders' meeting. "It's one we need to combat with other alternative systems."

"We'd like to convince Proctor and Gamble and others that when they have requirements in our territory, we can handle them," Sullivan said. Bypass is "a buzzword for competition. It simply says a customer will sense there is greater value by providing his own communications as opposed to using ours. So it's incumbent on us to stay at the leading edge of technology and meet large customer needs in such a way that they find it unattractive to put in their own," Sullivan said. ■

BUILDING UP VALUE-ADDED NETWORKS

BY DAVID HANSON

In biblical times, man communicated by fire. The announcement of a new moon, for example, was relayed from mountaintop to mountaintop by strategically placed fires. They were called the signal fires of Lackish — possibly the first network. Today, networks are still with us, and after a slow start, technology is rapidly converging on the integrated services digital network (ISDN), which appears to offer a unifying framework for the regional, national and global development of communications.

More than 10 years of planning have already gone into the ISDN, and it is a lot more real than we might think. Nevertheless, most of us are still living in the world of telex, message switching, packet switching and local-area networks and have to deal with the problems of making them work to satisfy diverse and often complicated business needs.

In the simplest terms, today's state of the art is telex, message switching and packet switching. The local-area network entered the market in 1981 with the introduction of the Xerox Corp.'s Ethernet system. After a brief battle between the broadband and baseband advocates, this flavor of networking seems to have settled down to wait for the development of standards. After all, connection technology is expensive.

Too many people lose sight of the basics, yet the magic of successful telecommunications simply involves getting the basics right. The primary issue is how to put users in touch with their data bases in the most cost-effective way — a way that will increase productivity within the organization. Some typical goals might be to provide data base access for all information workers, including fast response times to satisfy time-dependent access; and to reduce by at least 50% the amount of paper used to transfer and store information.

Because users usually refer to corporate entities divided into spheres of influence such as legal, accounting, manufacturing, customers and so on, the problem is to provide the best technology for exchanging information between them. The users are interested in accessing and processing information that may be stored either locally or at a great distance. This becomes increasingly complex as these users and processes are decentralized in such places as Hong Kong, Bahrain, London and ▶

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even New Jersey.

Historically, international business was transacted mainly by mail — with some use of telegraphic services to initiate funds transfers and other special services. In many cases, as the institution's global business was undergoing major expansion, there was a subsequent increase in offices and locations.

A typical corporation started relying more on the international telex facilities of RCA Global Communications, Inc., Western Union International and ITT for the transmission of its corporate messages and data processing. Use of the mail and the telephone started to diminish.

As volumes and geographic spread increased, costs began to rise and quality of service deteriorated. The complexity of international business was placing a premium on speed and accuracy. Exchange rates and commodity rates, for example, fluctuate rapidly. Customers often need credits or transfers completed and advice issued in a matter of hours, not days. Congested telex exchanges just could not keep up. There were an increasing number of lost and garbled messages and lack of timeliness in message delivery.

A typical solution to this set of requirements was the creation of a proprietary network that relied on terrestrial cable, fiber optics, underwater cable, satellite hops and line-of-site microwave to get from Point A to Point B, through nodal switching equipment and communications processors based on either message or packet technology. The choice was based on some business need, whether to reduce costs, improve service or expand markets.

Store-and-forward message systems have been the workhorse of our global telecommunications structure. Message switching is the technique of receiving a message, storing or journaling it and then transmitting it to its destination once an outgoing line is available. The journaling feature is important for two reasons. First, it is often mandatory that a record be kept of each transaction, especially for financial institutions; and second, since message switching does not provide for automatic, end-to-end error control or message confirmation, a method of retrieving the original message for retransmission to its destination is important.

THE FUNDAMENTAL advantage of this technology is that subscribers can economically deliver messages to one another even if the communications links are busy. The disadvantage is that the system is nonconversational and users cannot directly access computer applications and data bases.

Today, technology is converging on high-speed, on-line, interactive data networks that use international circuits more efficiently, maintain current services with no disruption and minimize the time and cost of implementation by using proven technology. Users and customers are no longer satisfied with relatively slow, one-way telex communication. The enormous growth in connections over the last two years attests to its popularity.

Today, technology is converging on high-speed, on-line, interactive data networks that use international circuits more efficiently, maintain current services with no disruption and minimize the time and cost of implementation by using proven technology. Users and customers are no longer satisfied with relatively slow, one-way telex communication.

We have come a long way since 1969 when the U.S. Department of Defense's Advanced Research Projects Agency developed an experimental communications network called packet switching, which used a revolutionary technique to support data communications traffic from large numbers of subscribers. Although the packet-switching concept offered significant advantages over message switching, it took more than 10 years before the technology was widely accepted.

The '70s witnessed the maturation of the packet-switching

technology from experimental use to widespread commercial practice. During that decade, numerous organizations established packet-switching networks in both the U.S. and Western Europe. Notable among these were Telenet, Inc., which was acquired in 1979 by GTE Corp., and Tymnet, Inc., a subsidiary of Tymshare, Inc.

As a matter of fact, this evolution is still in progress as many large multinational institutions and banks make the transition from message and other switching technologies. It is safe to say that packet switching is now at the core of the telecommunications community.

Packet switching is a variation of store-and-forward switching in which the message is broken up into segments (called packets) before transmission. This was done to reduce the delay ordinarily present in store-and-forward message switching due to having to wait for the reception of an entire message at an intermediate node before initiating transmission to the next node in the path. The packets can be transmitted independently through the network, thus reducing both delay and intermediate storage requirements for messages in transit.

Since data communications traffic tends to occur in bursts of activity over time, a full circuit dedicated for the exclusive use of one subscriber (as in a telephone call) tends to be inefficient and expensive for supporting short message transfers. In fact, for many applications, in the time it takes to establish a telephone connection, all the data that has to be transmitted could be delivered.

Packet-switching technology adds value to conventional data communications networks. The principal value added is the efficient sharing of communications bandwidth among large numbers of subscribers. Typically, this has allowed between 10 and 15 times as many data communications subscribers to be supported on the same physical facilities, compared with conventional dedicated or dial-up arrangements.

The key advantage of a packet-switching network is that delay is reduced by breaking long messages into smaller packets, while facilities are also efficiently shared among many subscribers. In addition, delivery routes do not have to be predetermined, although in practice, this has been preferable. The packet-switching system can select the route as the trip is being made on the basis of up-to-date traffic conditions.

Packet-switching networks are ideally suited for a large number of subscribers, each of which makes a relatively small demand on the system, but needs potential access to all resources. Under such circumstances, packet switching is much more efficient than preallocation systems such as the telephone network, in which individual transmission lines are idle except for occasional moments of actual use.

Since data communications traffic tends to occur in bursts of activity over time, a full circuit dedicated for the exclusive use of one subscriber (as in a telephone call) tends to be inefficient and expensive for supporting short message transfers. In fact, for many applications, in the time it takes to establish a telephone connection, all the data that has to be transmitted could be delivered. Because processing is used to facilitate the packetization, reassembly, storage and routing operations in the network, intelligent processors are stationed at each node. Hence, packet-switching systems reduce transmission line waste by increasing processing power within the network.

Packet switching has both desirable and undesirable aspects. Many consider the reliability of packet-switching networks to be their most attractive feature. This reliability derives from the ability to append checksums to each data block, or packet, and the capability for alternate and adaptive routing as a guarantee that a communications path exists between any two points in the network.

In addition, security is enhanced by the invulnerability of the network in two key areas. Since some messages will be divided into packets, and these packets may take different paths through the network, unauthorized access to a transmission link

would allow only partial interception of these messages.

Furthermore, since control in the network is distributed, it is invulnerable to systematic disruption. The adaptive routing based on local information is ideally suited to overcoming regionalized malfunctions.

Adaptive routing also results in several other major advantages of packet switching compared with most other transmission techniques. These include high point-to-point throughput, easy adaption to increased usage, performance insensitivities to transaction distribution and ease of expansion.

Undesirable qualities include cost, node throughput limitations, geography problems when host processors are not located far enough to take advantage of the sharing of long-haul trunks and the wasteful overhead associated with bulk transfers.

Even with its warts and undesirable properties, packet switching appears to be the best alternative to meet today's requirements for interconnecting diverse terminals and computers that have unique interface characteristics.

The availability of public packet networks is still limited — with the notable exception of the U.S., UK, Canada, France and, to a lesser extent, West Germany. It is expected that large-scale availability and interconnection of national networks to form international grids will not reach maturity before the end of this century.

The issue of whether to use the public networks or build a proprietary system is alive today. For many large users, a fixed-price leased line is often cheaper than the usage-sensitive public network. Experience has shown that fully loaded private network costs can vary widely. A good rule of thumb is that one can expect to save 50% of commercial costs. At some point on a cost vs. message volume curve, it makes sense to install a proprietary network.

While cost is important, it is not the only consideration. The basic business premise is that proprietary networks are less expensive than access to the commercial carriers and provide better service, more control, greater geographic representation and so on.

A private network ensures the user greater availability through enough reserve capacity to meet peak demand; reliability through the direct management of switching equipment, backup capability and so on; and security for safeguarding sensitive information through encryption, authentication and other means.

Disadvantages of the public networks include the inability of the network to provide customized solutions to meet a company's unique requirements. Also, some countries' public networks do not provide efficient service for expanding markets. For example, Korea does not even have a public data network. The public data networks, however, are not without their benefits (see sidebar at right).

Today, many myths are associated with ISDN. The biggest myth is that it is an exotic new concept that will be everything to everybody. Nothing could satisfy this expectation and certainly not within an time frame agreeable to most multinational corporations. It will not solve all corporate problems, but it is probably the single biggest strategic event occuring in the telecommunications industry today.

What are the benefits of a private network to a multinational corporation? What are its functions? The most immediate benefits are often the reduction of telephone and telex costs for internal administration and the resulting improved efficiency.

The resulting high-speed highway can deliver data to customers and users alike, serving the entire corporation by delivering a wide range of information and DP services. The network will improve connectivity between regional applications and customer equipment as well as with other networks. Intelligent switches will spread the traffic evenly over the network, thereby improving the efficiency of line utilization. Management information systems will generate traffic and other statistics, as well as telephone-type bills to control expenses.

Many multinationals, however, will continue to operate using telex. Private networks can or will have the capability to do least-cost routing of a message to such users via telex refile.

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Phil Black, president of Telelec, Inc., said recently that ISDN is not a network, but a set of recommendations that takes existing networks and adds to them and makes them work together to provide answers.

Certainly, some of the networks and techniques that might logically be considered to be part of the ISDN already exist. They include packet switching, teletext, videotex and digital facsimile, and most applications can be delivered by existing telephone and cable TV plant. The long-distance trunk capacity of satellites, microwave, fiber optics and so on are all there.

A recent issue of *IEEE Communications* magazine defined the ISDN as:

- Providing digital end-to-end channels under customer control;
- Accommodating a broad scope of services with interleaved bit streams;
- Presenting standard interfaces for user access.

With respect to the third element, CCITT Study Group XVII has been developing the standards for 16K bit/sec D and 64K bit/sec B channels for information, signaling and other uses. They will be presented to the 1984 CCITT Plenary for approval. Many details of the interfaces will not be pinned down, however, and incompatibilities are certain to exist for the mid-term.

Today, the greatest issue is planning the ways that a business can use the ISDN as an extension of its in-house capability. The ISDN can be a pure pipeline, but that is not what it is all about. The ISDN is destined to be the value-added network of the future with many new services and features beyond those provided today by the packet networks. These exotic new services are blue sky at this point.

Most users today, however, are not waiting for the ISDN to become a reality, like packet switching is today. They are proceeding with their own private networks, hopefully confident that the ISDN will not make them obsolete until they are fully depreciated. ■

USERS PUT MINNESOTA ON THE MAP

BY AUGUST H. BLEGEN

Minnesota is a good example of a state in which a new voice is adding to the public discussion on the future direction of telecommunications regulation. According to the charter of the Minnesota Business Utility Users Council (MBUUC), its purpose is "to assure that the rates charged for telecommunications services and equipment are fair and reasonable and in the public interest and to take such actions as its members deem appropriate and in the interest of telecommunications users."

This may sound like the charter of a traditional consumer advocacy group or even the local telephone company, but it is not. Organized as an ad hoc group in 1980 and as a permanent association in January 1983, MBUUC is comprised mostly of large corporations in Minnesota, but also includes some small businesses such as automobile dealers and real estate offices. MBUUC's accomplishments have been substantial. During its brief existence, it has participated in 10 proceedings before the Minnesota Public Utilities Commission and ▶

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THE MINNESOTA BUSINESS UTILITY USERS COUNCIL HAS A SERIES OF SUCCESSES AS LONG AS ITS NAME.

Minnesota Users

in several conferences on telecommunications conducted by the Minnesota Legislature.

In the process, it has established a good working relationship with commission staff and other interested parties. The members of MBUUC believe this has had a positive impact on recent public policy decisions. The experiences of this group may provide guidance for other states.

THE MINNESOTA PUBlic Utilities Commission consists of five members appointed by the governor. It is charged with setting fair and reasonable rates for telephone service, regulating the quality and service conditions of telephone companies within the state and determining which companies will have the authority to provide intrastate service. Similar commissions exist in nearly every state.

In Minnesota, regulated telephone companies periodically file general rate cases as part of the rate-regulating process. Through these filings, the appropriate rate of return and revenue levels are established, and the rate design between different types of services and classes of customers is determined. In any given year, there are also a number of miscellaneous tariff change filings. In recent years, there have been generic rate investigations dealing with such matters as intrastate access charges and intrastate competition and deregulation.

In general rate cases, a final Minnesota Commission decision is reached after extensive public and evidentiary hearings are conducted, in which any interested party may participate. In addition, formal parties in intervention have the right to present the testimony of expert witnesses, cross-examine the witnesses of other parties and present briefs and oral arguments to the hearing examiner and the commission. Similar public and evidentiary hearings are held in generic rate investigations and, when requested and warranted, in connection with miscellaneous tariff filings. However, in miscellaneous filings, the overall revenue needs and levels of the telephone company are usually not the subject of inquiry. In all likelihood, a similar process is followed in other states, with, at the very least, notice to interested parties and the opportunity to have either formal or informal input.

The process in Minnesota is open and, over the years, has encouraged a variety of parties to participate. The Minnesota Department of Public Service is a regular intervenor in any telephone company filing or commission investigation. This department is charged with investigating all telephone company filings, representing the broad interests of the general public and making recommendations to the Public Utilities Commission.

By the late '70s and early '80s, several other groups had joined the telephone company in major telephone rate filings. These included the Office of Consumer Services and such residential interest groups as senior federations, handicapped federations, public interest research groups' councils and other ad hoc groups formed to participate in particular cases.

At that time, it was rare for any party to take up the interests of business users and even rarer for business users themselves to become involved in the process. Indeed, the bylaws of the telecommunications users association in Minnesota prevented it from becoming involved in proceedings before state agencies and the courts. As a result, there was a lack of information available to telecommunications operations managers, who were often only informed of rate changes the day before a press release was issued on the final approval of the annual general rate filing. Remember when your local telephone company representative informed you of regulatory and rate changes after they had become fact and long after the telecommunications budget for the particular period had been submitted?

There had to be a better way, and rate shock forced this in late 1979. As in most states, the local Bell operating company in Minnesota, Northwestern Bell, filed a restructured private-line tariff that included increases of several hundred percent for most rate classifications. These included Centrex off-premise extensions, intrastate tie lines and private lines and a host of other private-line categories. The increases were measured in tens of millions of dollars per year and would have fallen almost exclusively on business and governmental users. For many companies that later became MBUUC members, the filing would have meant annual increases in private-line rates of several hundred percent. Pillsbury Co., for example, was looking at an annual increase of about $400,000 for Centrex off-premise extension stations alone.

At this point, MBUUC decided that the filing had to be opposed. It organized on an ad hoc basis to intervene in the proceedings before the Minnesota Commission. In one of its first actions, MBUUC retained the law office of O'Connor & Hannan in Minneapolis.

Through counsel and the testimony of several of its member communications managers, MBUUC, together with a number of other intervenors, opposed the private-line filing and participated extensively in the hearings. On May 5, 1981, the Minnesota Commission rejected the filing until further modifications could be made to correct errors in the cost study and proposed tariffs. In June 1982, Northwestern Bell refiled modified cost studies and tariffs. As modified, the rate impact for MBUUC members was reduced substantially, and for many companies, the rates actually went down. While MBUUC submitted comments to the commission on several aspects of the new filing, it generally did not oppose the new rates, given the significant improvement for MBUUC members. On March 1, 1983, these rates were approved by the commission.

Since the private-line case, MBUUC has participated in a number of proceedings that have involved both immediate issues concerning the rates its members pay and long-range issues relating to the future structure of the telecommunications industry.

One of the first of these proceedings involved a January 1983 proposal by Northwestern Bell to restructure tariffs for AT&T Dimension equipment under the Two-Tier and Companion Rate Payment Plans. Under the proposed repricing, Dimension rates would have increased by several million dollars per year. MBUUC opposed this filing based on the impact it would have had on business users and defects in the company's underlying cost studies. The council requested a full public hearing. Ultimately, the proposed new rates were withdrawn and, to date, have not been refiled. A similar result was obtained in connection with a 1A key equipment filing that was also withdrawn in early 1983.

On a broader basis, MBUUC also participated extensively in the investigation and determination of the proper structure of intrastate access charges in Minnesota. This, of course, was an outgrowth of the court-ordered divestiture of AT&T and the Federal Communications Commission (FCC) access charge plan decision in FCC docket 78-72. At this stage, only an interim order has been issued by the Minnesota Commission and considerable uncertainty continues because of actions at the federal level. Nevertheless, the approach taken by the commission appears to be one that will lead to a sound and balanced rate structure.

Of particular interest to MBUUC, the interim order rejects an intrastate special access line surcharge. In addition, it prohibits any change in rates that would increase existing private line revenues. It also adopts an intrastate access charge for Centrex lines on a trunk equivalency basis.

Currently, MBUUC is a party to the Northwestern Bell general rate case in which a final commission decision will be issued this July and a filing involving the repricing of Centrex to make it more competitive. It is also involved in a recently begun generic investigation on whether intrastate toll competition should be allowed and, if so, whether rates should continue to be the subject of regulation by the Minnesota Commission.

Since the start of its activities, MBUUC has been transformed from an ad hoc group that met only when a problem arose — and usually just before it was about to be resolved unfavorably — to a permanent, ongoing association. Several key elements of MBUUC's organizational structure may suggest features to consider in forming a users group in any state.

First, MBUUC has limited its membership to business and governmental entities that are primarily users, rather than vendors, of telecommunications services. As stated in its bylaws, membership is open to corporations, unincorporated businesses and their divisions and subsidiaries and governmental units. It is also open to other entities that use telecommunications services, equipment or systems in Minnesota and are not primarily engaged in the sale or rental of telecommunications

services, equipment or systems, as a communications common carrier or otherwise.

Second, MBUUC has placed considerable emphasis on continued monitoring and evaluation of developments in telecommunications regulation. It has devoted a significant portion of its efforts to keeping abreast of new developments and trends. It has also contributed informal input toward utility and governmental decisions on telecommunications policies. MBUUC does not expect to intervene formally in every matter that is filed, but rather attempts to select matters that may have the greatest long-range impact.

Third, the MBUUC assessment structure is designed to facilitate its ongoing efforts. The continuing monitoring, evaluation and informal participation of MBUUC is financed by annual assessments established equitably among members by the MBUUC Executive Committee. A member's annual corporate telecommunications budget within Minnesota is used as an annual assessment guideline.

Formal participation through intervention in a particular rate-making proceeding is financed by special assessments to be paid by MBUUC members who express a desire to finance such activities.

SO, WHAT IS in the future for groups such as the MBUUC? It is ironic, given the flurry of regulatory activity in recent years, that one question asked more frequently than any other is: After divestiture, why do we need to watch regulatory developments? The answer is that the divestiture of Jan. 1, 1984 merely signaled the start of a regulatory evolution — not the end of the race. The changes in the telecommunications industry will affect more people than the deregulation of the airline and trucking industries, and it will take the rest of this decade for the regulatory scenario to begin to play out.

For example, the last decision in the AT&T divestiture litigation is not scheduled for final approval until Dec. 31, 1994. This date provides some indication of the time frame in which telecommunications regulatory issues will begin to be settled. Certainly, the next three years will be active ones in this field, and one can expect that continued technological change will be the driving force behind further regulatory responses long after the initial issues are resolved.

What benefits might be obtained by becoming involved in the formation of a business users' group in your state? Four significant benefits can be realized:

- It would create an opportunity to influence changes in telecommunications that will affect your company's future operations, business opportunities and profitability.
- You would become aware of regulatory proceedings and legislative affairs that will aid you in day-to-day operational decisions and in long-range planning.
- Such involvement is likely to provide access to legal counsel and consultants experienced in telecommunications regulatory affairs.
- It would provide an opportunity for your firm to save money in telecommunications expenditures.

Telecommunications will be the driving force behind most corporations' ability to serve their customers more efficiently in the '80s and '90s. Many other corporate activities, including data processing, electronic and integrated offices, local-area networks and so on, will be subsets of telecommunications — the glue that will hold the whole body together.

Thus, everyone would benefit from a sound and balanced approach to telecommunications regulation. A business utilities users council in your state can help. ■

EVEN WITH A MONTHLY PHONE BILL OF $219,874, EVELYN OLSCHEWSKI STILL LOOKS ON THE BRIGHT SIDE OF LIFE.

DOWN TO EARTH USER EVELYN OLSCHEWSKI

BY BRUCE HOARD

BOSTON — "I came in here and discovered an octopus," Evelyn Olschewski says with a wave of her arms. Twenty-two years later, the nature of the beast she must tame has changed, but the director of communications at Massachusetts General Hospital is still fending off telephone tentacles.

When she started her temporary job at Mass. General in 1962, after tiring of the advertising business, Olschewski (pronounced Ol-shev-ski) was asked to retype the prestigious hospital's telephone directory. It was in "awful" condition, so she reorganized it from front to back. Impressed with her work, her supervisor asked her to sign on full-time.

Now, with responsibility for 6,160 telephones, 35 telephone operators and a $3-million budget, the sprightly, silver-haired communications professional has far more complex problems than reorganizing telephone directories. Take, for instance, her monthly phone bill of $219,874. Please. Just bring a wheelbarrow into her 13th-floor corner office and load it up.

You could load a dump truck with the woes that have befallen Olschewski and her staff since the Bell System broke up on January 1. As if the regulatory snafus associated with the Bell breakup weren't enough, she had to contend with another one, Chapter 372, a recently passed law controlling Massachusetts hospital costs. Chapter 372 froze hospital hiring, leaving the director with no way to replace three key people who left for other jobs.

"I had a situation that I never want to go through again," she says with a ▶

Hoard is editor of Computerworld On Communications.

Evelyn Olschewski

Olschewski's department is a beehive of activity.

laugh. The good-natured Olschewski laughs frequently, even at painful memories. She recalls being told by a Federal Communications Commission attorney that understaffed communications departments wouldn't make it through the post-Jan. 1 turmoil. "I almost didn't make it," she says.

"We had all the problems that everybody else had — trying to deal with two companies that wouldn't talk to each other, AT&T and New England Telephone. And we had all the problems of trying to reconcile the records and the billing."

Mass. General is a Centrex II user. What has New England Telephone done to reassure her that her Centrex service will be maintained? "Everything they can," she says. Line rates have been reduced to reflect increased access charges, and previously unavailable electronic features have been promised for later this year.

She has also been offered "assured rates," an offer she is considering with some skepticism. "I hope that their assured rates are a little bit more dependable than the AT&T assured rates," she observes somewhat dryly. This leads her into a discussion of AT&T's "price predictability" for equipment being rented from AT&T. AT&T came by with a chart depicting prices for equipment and claiming all prices would be equalized nationwide within two years.

When the next bill came in, she discovered that the rates had gone up higher than stated, and charges

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were levied for equipment that was free in the past. When one of her employees called AT&T for clarification, she was told that the promised prices were now being established over a one-year period instead of two. Olschewski maintains that AT&T has also failed to deliver a promised impact study on rental prices and that equipment purchase prices have not arrived.

New England Telephone is also a target of her wrath. The operating company wants the hospital to do other "unreasonable" things, she says. It wants to sell wiring, but before that happens, an operating company representative must come in and do an inventory, billable to Mass. General. The rub is, New England Telephone will not say what that inventory will cost, according to Olschewski.

There is more. Telephone company personnel are changing jobs so often, Olschewski never knows who she will deal with next. Because of that, she

told New England Telephone not to bring in anybody to meet her until she can be sure that person will be around for the foreseeable future. "I've had people traipsing through here, and three days later, I call them up only to find they've been moved on to another job," she declares. "Nobody knows which end is up or how it's going to fall out," she adds, shuffling her way through sheaves of paper.

"So you can't believe anything that either one of the companies tells you," she observes. "It gets to the point where you laugh about it because it's so silly."

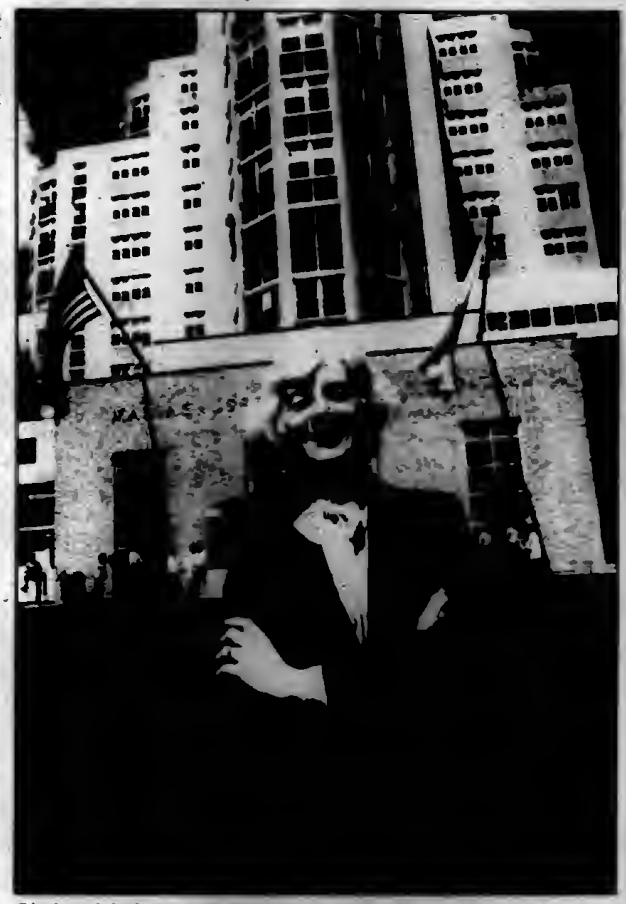
EVELYN DUNN OLschewski was born. This much is self-evident. Just when she was born is less certain: She'd rather not talk about it. For those sleuths who wish to investigate the matter further, there are nuggets of information to be gleaned from listening to her recount some historical facts.

She was born in Akron, Ohio, the youngest of three daughters. Her family resided in Akron during her first six years, moved to Los Angeles for the next three and then took a round-the-world journey for the next year and a half. When they returned, her parents, whom she describes as "entrepreneurs," took over a small laundry bleach distribution business during the Depression. Olschewski recalls the world trip with relish because it was an unusual opportunity during those hard times.

After graduating from Akron High School and Akron University, where she majored in speech and sociology, Olschewski took an advertising job with B.F. Goodrich Co. for three years. Then she "flew the coop," moving to Cleveland and another advertising position which lasted for another year and a half. Then it was on to Boston for the summer of 1955, a summer she had planned to take off. Instead, she fell into a "glamour job" at another advertising agency, traveling around from one client to another with a photographer in tow, and then returning to her office to write copy on the clients. Olschewski describes all this with elan, gesturing with her arms and hands, enjoying the memories and smiling at their recollection.

After winning the full-time job at Mass. General, she was put to work in a job without a title. "They didn't know what to call me, so they called me a telephone coordinator," she says. This was decidedly not a glamour job; instead, it was pawned off on someone considered unimportant. At the time, the hospital had an eight-station switchboard, and operators were thought of as second-class citizens. Her new boss challenged her to organize the department, saying she had been preceded by someone with 20 years of telephone company experience who had given up in failure after only 10 days.

The story of her progression through job titles is an interesting one. After a year as telephone coordinator, she attended a meeting where name badges were worn, and she simply decided to rename herself, writing in "communications manager" on her badge. After another five years, she "latched on" to the title "director of communications" after repeatedly being referred to as such by Dr. Charles Sanders, who was general director of Mass. General at the time. She is reluctant to recount the parade of monikers because, "I don't want anything to sound disorganized."



Olschewski's department handles life-and-death calls at Mass. General.

NO ONE COULD ACcuse her department of being disorganized. Located across the hall from her office, it is a beehive of activity with six operators: two taking incoming calls to the hospital's main number, two paging calls and two taking calls for patient information.

The critical nature of hospital communications is underlined by the life-and-death nature of some paging calls. Olschewski's department receives over five calls a week concerning a cardiac arrest or possible cardiac arrest. Under those conditions, doctors must be located quickly and dispatched to the crisis scene. And it's not always patients who are in peril.

"One time a man just walking through the hospital had a cardiac arrest," she says.

There have also been other emergency situations. Two years ago, some outside street cabling was being rerouted. When a night full of rain flooded the exposed wires, many of them failed, knocking out half of the lines into the hospital. "It would have been a much worse disaster, but a long time ago, we arranged with the telephone company to split our entry into the hospital," the director observes.

Whenever a group of telephone numbers is going into an office or department, her department makes sure the cables are divided into two groups, each entering the area via separate paths.

"We have half of them come in one way and the other half come in another way," she says. "So if there is an emergency like that, we're not out completely."

The story of her progression through job titles is interesting. After a year as telephone coordinator, she attended a meeting where name badges were worn, and she simply decided to rename herself, writing in "communications manager" on her badge.

Olschewski developed a policy of encouraging outside callers to call directly to internal telephone numbers so calls to the main number constitute only 10% of incoming calls. She is particularly proud of the paging service, which handles 4,300 calls on an average weekday. "They are so good," she says of the two operators as they receive call after call. Because of the voluminous paging traffic, operators are shifted around all three stations every two hours to prevent excessive fatigue. Of the 4,300 paging calls, 3,300 come from within the hospital, and 1,000 are external. The director is

Evelyn Olschewski

careful to introduce and laud each person on her staff as she conducts a tour of the facility.

Everyone receiving a pager is required to come up to the 13th floor and see what happens there-personally. "The doctors come here first to see that these people are human beings," she declares.

OLSCHEWSKI IS MARried with no children. Her husband is a painter and illustrator who is not averse to staying home and doing the dishes when his highly politicized wife goes out to work for one candidate or another. His paintings adorn her office as do plaques from such organizations as the International Communications Association and the New England Telecommunications Association. In 1970, she was proclaimed "Woman of the Year" by the New England Hospital Telecommunications Association in recognition of civic contributions, which include being a Big Sister.

There is also a little sign that declares, "Sexism is a Social Disease."

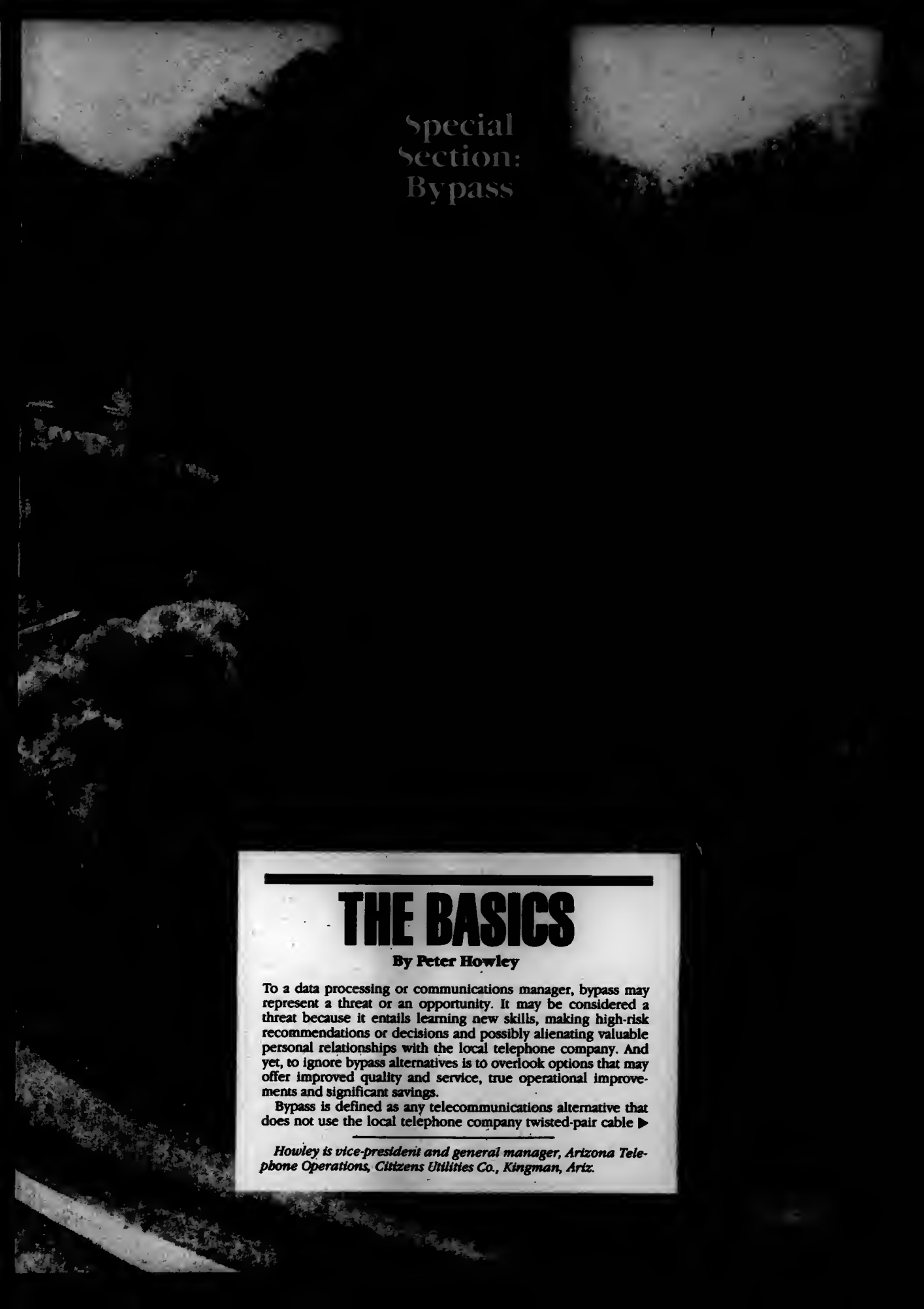
When asked to comment on sexism in communications, she speaks positively of her professional interaction with men. Within a year after starting at Mass. General, she attended a meeting of the then almost exclusively male New England Telecommunications Association. Among active members, there were only herself and two other women. Olschewski remembers the time positively, saying, "If there was discrimination — and I don't think there was — we were not aware of it. Our consciousness had not been raised yet."

Within a year after starting at Mass. General, she attended a meeting of the New England Telecommunications Association. Among active members, there were only herself and two other women. Olschewski says, "If there was discrimination — and I don't think there was — we were not aware of it."

But, she says that there is sexism in the communications industry just as in any other industry and deplores the practice of calling her female operators "girls." Her way of fighting discrimination is through persistence and dialogue rather than confrontation and conflict.

Olschewski's husband Alfred achieved a breakthrough of sorts at the International Communications Association annual conference and exhibition in New Orleans in 1974. Olschewski remembers how husband and wife decided to combine some vacation time with the show, which created some empty time for Alfred while his wife attended to business. After describing this scenario, she pauses coyly for a moment before saying, "And they had a wives program. . ."

Well, the next year they had a *spouses* program renamed specifically in Alfred's honor. "He had a ball," she recalls. ■



Special Section: Bypass

THE BASICS

By Peter Howley

To a data processing or communications manager, bypass may represent a threat or an opportunity. It may be considered a threat because it entails learning new skills, making high-risk recommendations or decisions and possibly alienating valuable personal relationships with the local telephone company. And yet, to ignore bypass alternatives is to overlook options that may offer improved quality and service, true operational improvements and significant savings.

Bypass is defined as any telecommunications alternative that does not use the local telephone company twisted-pair cable ▶

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network. This definition is broad enough to include cases in which bypass is accomplished by the local telephone company itself. This brings up an important point to remember when considering bypass: Do not ignore the local telephone company as a bypass supplier. Independent telephone companies have always tended to be receptive to doing things differently, primarily because their smaller size gives them more flexibility and quicker decision-making ability than larger telephone companies. However, the divestiture of the Bell System has caused great changes in the local Bell operating companies. Today, most of the Bell operating companies, if not all, are examining the option of becoming bypassers themselves. As a result, you may find your local telephone company, independent or Bell operating company receptive to working with you on providing a system to bypass the twisted-pair cable network.

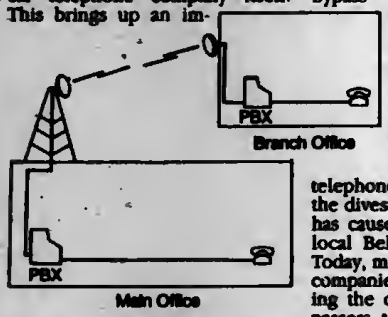


Figure 1. Private Microwave

The principal techniques available for bypass can be divided into two categories — fixed and mobile. The fixed category includes:

- Microwave;
- Digital termination systems (DTS);
- Coaxial CATV;
- Fiber optics;
- Direct broadcast satellite (DBS);
- Local-area networks;
- Teleports;
- U.S. Postal Service Electronic Computer Originated Mail (Ecom).

The mobile category includes:

- Cellular radio;
- Specialized mobile radio;
- FM subcarriers (FM-SCA), which offer paging and electronic mail.

These categories were used for an important reason. Fixed technologies represent standard ways of replacing twisted-pair cable. The mobile group will also serve this purpose. But mobile technologies also reflect a major improvement in communications — a tremendous opportunity to enhance corporate communications as suppliers learn to deliver mobility at an acceptable low price. Just look at the explosive use of paging equipment: More and more, businessmen and even busy top executives are using it along with servicemen, firemen and doctors.

This brings up an important point to remember when considering bypass: Do not ignore the local telephone company as a bypass supplier. Independent telephone companies have tended to be receptive to doing things differently, primarily because their smaller size gives them flexibility.

Point-to-point microwave is probably the most popular, least capital-intensive technique used today for bypass. A typical 18- or 23-GHz microwave system is shown in Figure 1. In this case, a major insurance company in Fort Wayne, Ind., analyzed its calling to a branch office five miles from headquarters. The economic analysis showed that with a private 18-GHz microwave link between the two offices, it would save 12% a year compared with leasing telephone company facilities.

In addition, the MGM Hotel Casino in Las Vegas bypassed both the local exchange and toll networks via microwave. After reaching an agreement with Starnet Data Systems, a reseller, for handling its interstate traffic, MGM apparently became dissatisfied

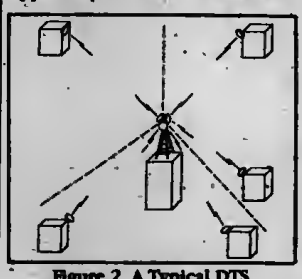


Figure 2. A Typical DTS

with its efforts to obtain local loops. So, MGM installed its own point-to-point 18-GHz microwave system to Starnet's downtown location.

Yet another bypasser is General Electric Co., which uses a 23-GHz microwave system. At both ends, the customer has installed local-area networks. The growth of local-area networks in which a customer installs his own wiring within a building or complex, usually for combined data and voice transmission, is, of course, one of today's hottest trends. There are approximately 8,000 local-area networks now in service with large customers.

A typical local-area network might employ data terminals tied together using three types of cable: three-pair twisted, coaxial and computer. Frequently, a private branch exchange (PBX) is used to switch both voice and data in this local bypass technique.

DTS have received a lot of publicity, particularly for larger cities (see story on Page 35). As Figure 2 shows, DTS are simply point-to-multipoint microwave. Standard configurations entail three or four back-to-back antennae, each serving one sector transmitting and receiving messages. Each message has an address, with customers picking up only messages addressed to them.

DTS are experimental: There are none in service today. They are designed for wideband data, 9.6K bit/sec to 56K bit/sec. Even though companies like MCI Communications Corp. have filed to serve 30 to 40 cities within the next five years, DTS are not designed for handling voice. With today's technology, DTS could handle about 75 voice circuits, which is not economically competitive with telephone company cable. This could change.

The coaxial facilities of CATV companies pose a long-term alternative for bypassing — in rural as well as urban areas. CATV is widely distributed. Federal legislative efforts seem favorable toward allowing CATV companies to provide most telecommunications services without regulation.

Conceivably, CATV companies could sell their entertainment services to cover their principal costs and use incremental costs as a technique for gaining entry into communications. It is worth investigating.

CATV does have some major hurdles to overcome first. There is no equipment today that economically puts two-way voice and data on CATV cable. Most CATV systems still use 12- and 24-channel, one-way-only systems. However, a lot of effort is going into equipment development, the best known being the MCI-Cox Cable Co. trial in Omaha, Neb.

CATV companies themselves are also vulnerable to competition in various new and old forms. All in all, however, CATV represents one of the best long-term bets for large-scale bypass of local telephone networks.

Up until the past few years, fiber optics was a relatively unknown and little-used technology. Fiber optics has high capacity and certainly can be used for bypass, but because of cost and problems with installation in urban areas, the main users today are telephone companies and long-distance carriers.

There are two types of DBS: one-way and two-way. Satellite Business Systems (SBS) has spent well over $600 million developing two-way systems. Two-way is very expensive; a lot of traffic is needed to justify it. As a result, it has not developed into a serious bypass alternative for any but the largest customers in large urban areas. In fact, last year, SBS reported losing $123 million.

One-way DBS is a different story. Many big companies, including RCA American Communications, Inc., CBS and SBS, are jumping into it. It is aimed initially at the rural home television market, competing ultimately with standard and cable TV. Conceivably, in a small way, it could be a bypass option for services such as reservations and electronic mail.

Teleports are the conglomerates of bypass. Currently, Merrill Lynch & Co., Inc., Western Union and the New York Port Authority are constructing a teleport on Staten Island to serve the New York City area. The center, which covers 200 acres, will be served by 17 satellite dishes connected by high-speed fiber optics to customers in Manhattan, and it will have both twisted-pair and coaxial-cable wiring in the buildings.

In particular, the teleport in New York has had a lot of publicity, but there are many others in various construction or planning stages, each slightly different. They include new, complex developers and reflect a method for bypassing using someone else's system rather than building your own.

In 1982, the U.S. Postal Service started Ecom in 25 cities. With this service, a letter brought into one office is transmitted electronically to one or many other offices and then delivered locally through normal mail service. The postal service is probably its own worst enemy, but worth keeping an eye on.

Under the mobile heading are some interesting bypass technologies. Cellular radio has received a lot of publicity. Figure 3 shows a standard configuration with a control or billing computer and a number of antennae, each serving a cell connected by leased telephone company lines or microwave. As a unit moves from one cell to another, it is automatically transferred to the closest antenna. At the computer control center, the cellular network is connected to the Direct Distance Dialing (DDD) network or another network.

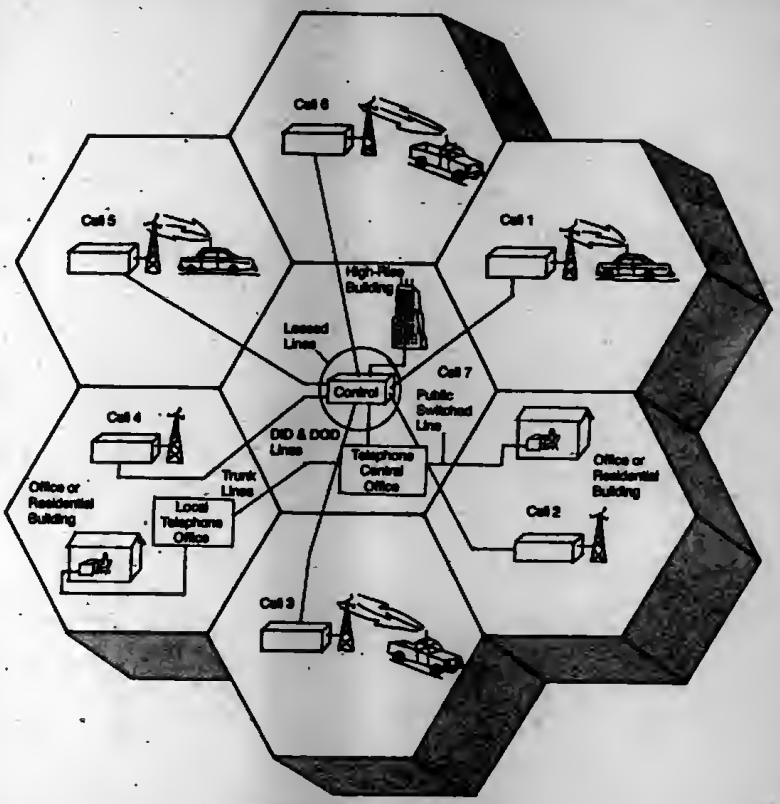


Figure 3. Cellular Radio System

According to some popular articles, cellular radio is quickly going to make the local telephone plant and telephones obsolete. Everybody is going to carry a personal portable telephone, eliminating the need for a standard office or home telephone. However, if you look at the facts, this scenario is just not going to happen. Most economic studies and telephone company experience with Improved Mobile Telephone Service indicate that costs must not exceed a one-time $250 charge and monthly costs of $50 in order for cellular radio to compete effectively with the local telephone company. Yet, cellular is extremely capital-intensive with individual phones costing $2,000 to $3,000 each. Even the most optimistic studies do not show these costs dropping very far for at least 10 years. Realistically, do not expect cellular radio to even begin to replace standard telephones before the end of this century, if then. However, cellular radio is important as a new service offering opportunities for innovation in communications mobility.

Specialized Mobile Radio (SMR) is a technology worth investigating. It is an inexpensive, easy-to-provide, mobile radio system. Unfortunately, it has many limitations that cellular radio does not.

However, following a recent Federal Communications Commission (FCC) decision, SMR can be connected to the DDD network, and it is much less expensive than cellular radio. If the FCC continues to reduce SMR restrictions, it could become an effective competitor for low-cost mobile telephones.

Another interesting mobile bypass development involves FM subcarriers, officially called FM-SCA. In April 1983, the FCC authorized FM radio stations to do just about anything they wanted with the unused portion of their assigned FM radio frequency, including leasing it to others. Radio Data Systems in Salt Lake City,

Can We Talk?

INTERLAN

The Basics

Utah, is using FM to provide stock market and commodity quotes to subscribers. It also offers electronic mail to subscribing banks and chain stores throughout the Southwest.

Figure 4 shows an FM-SCA system, this one an innovative trial being conducted by a power company to control peak power loads. Consolidated Edison, the New York power company, has installed special radio equipment at many of its customers' locations to turn its customers' equipment on and off.

THERE ARE MANY who believe that these frequencies would be ideal for paging, with costs about one-fourth of a standard system using antennae. This technique, along with cellular radio, SMR radio and FM subcarriers, offers some interesting bypass alternatives that involve mobility.

There are many means of bypassing the local telephone company networks. Some obviously pose greater investment and technological risks than others. In addition, some are years away from becoming significant economic alternatives.

Some, particularly those providing mobility, are more complementary to the twisted-pair network: They offer new forms of communications, rather than simply replacements for it.

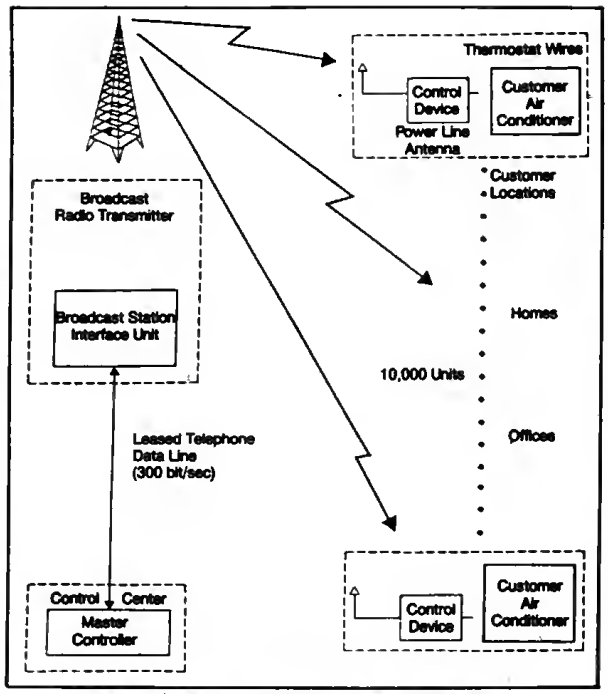


Figure 4. FM Carrier for Utility Load Management

But obviously, bypass is taking place for sound reasons in many instances. The various bypass technologies should be considered as an alternative to the local telephone company twisted-pair network.

However, there are also some important skills that a corporate data processing manager or a communications manager must understand in doing studies on bypass.

ONE OF THE MOST important of these skills is knowing how to do Present Worth studies. These economic analysis techniques allow a comparison of the costs of building different bypass systems over their life (10 to 20 years) with the cost of leasing facilities.

Traditionally, these studies include not only equipment and installation costs, but also ongoing expenses such as maintenance, depreciation and taxes. They are a method for considering the time value of money, since obviously money spent in the future is "cheaper" than the same expenditure today.

The use of such plans to motivate the local telephone company and the serious consideration of that company as a bypass supplier are also recommended. Assuming they are interested, telephone companies have two particularly important assets to contribute: expertise and capital.

If your local telephone company is not interested, consider approaching an independent telephone company. There are many of these companies that are hungry for new ventures, will even consider joint ventures and may be willing to provide engineering assistance. ■

Should Your Company

Should your company be considering bypass? Let's take a look at those companies doing most of the bypassing today. They are listed below:

- Federal, state and county government;
- Fortune 500 companies;
- Banks;
- Universities and schools;
- Transportation (railroads);
- Utilities;
- Radio and newspapers;
- Office complex developers.

Obviously, size is one of the most common characteristics. This is closely followed by a requirement for high-volume communications between two or more locations, particularly within one city or area.

In almost every state, there are existing private systems operated by state and local governments. These include the highway department, law enforcement agencies, emergency services and similar groups.

Another significant motivation for bypass is dissatisfaction with banks, Fortune 500 corporations and other companies with large communications needs. These firms frequently have enough traffic or special data needs to justify bypassing.

If your company fits one of the categories listed above, then you should be considering bypass alternatives.

There are many reasons to bypass, including economics, data needs, price stability, service intervals, emotion and convenience.

The major reason companies bypass is cost savings. Most corporations want to be assured that bypass will save them up to 30% before the [illegible] while, equally [illegible] following factors [illegible]. In some cases, it may be worthwhile to bypass even if it [illegible] costs more.

Probably the [illegible] reason for bypass [illegible] is dissatisfaction [illegible] local telephone [illegible] Bell and Less [illegible] services at [illegible] carriers. Corp. [illegible] "We don't plan to [illegible] exchange carrier, [illegible] telephone [illegible] a bottleneck [illegible] They are [illegible] non-responsive."

My guess is that three-fourths of all the bypassers to date did so because of unpleasant frustration and anger. Customers cannot, and sometimes they just will not, sit around for eight or nine months to find out if the local

Special Section: Bypass

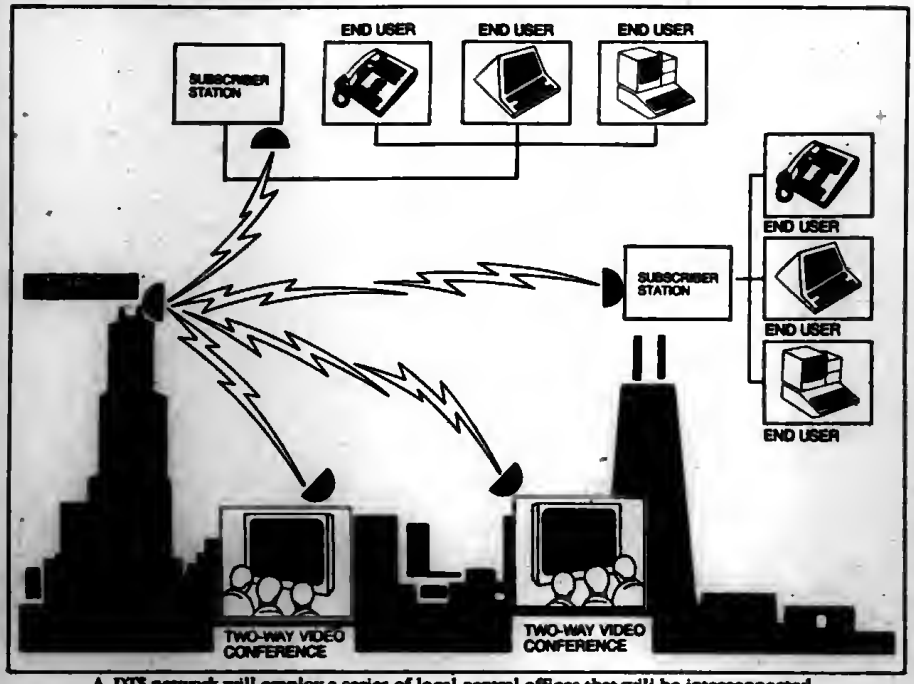
DIGITAL TERMINATION SYSTEMS

By Walter Ulrich and Ronald Bohm

A digital termination system (DTS) is a common carrier service designed to provide flexible, low-cost digital communications within a community. A DTS uses a specially reserved portion of the microwave spectrum to transmit high-speed information down the block or across a city. The traditional telephone ▶

Ulrich is president of Walter E. Ulrich Consulting, Houston. Bohm is president of First Communications Group, Inc., Northbrook, Ill.

Digital Termination Systems



A DTS network will employ a series of local central offices that will be interconnected.

company plant lacks the quality and speed to support all the communications needs of modern business. DTS is one of several alternative technologies to bypass the traditional copper wire plant of local telephone companies.

DTS technology was originally conceived for high-speed data and document communications. On a closer look, however, a DTS might also be advantageous for large-volume users of local exchange voice services.

In the mid-'70s, Litton Industries, Inc. applied to the Federal Communications Commission (FCC) to set aside a little-used portion of the microwave spectrum. This particular spectrum, from 10.55 GHz to 10.68 GHz, worked especially well in microwave cooking ovens for browning meat.

Xerox Corp. had a better idea. Xerox envisioned an office of the future in which documents were exchanged electronically at a page per second. Satellites would handle the long-distance transmission. A problem remained: How would the document get from the local facility to the satellite dish? Xerox's answer was to use that microwave spectrum as a high-speed collection and distribution medium within the local exchange area or local loop.

Xerox named its concept Xten. Documents would be fed across town using microwave, transported cross-country using satellite and then distributed locally using microwave. Traditional telephone services would not be needed. The FCC called this concept digital electronic message services and allocated the microwave spectrum for DTS.

In 1981, experiments conducted between San Francisco and New York validated the concept. DTS microwave carried documents and data across San Francisco's rooftops. From a satellite disk at San Francisco's Embarcadero Center, a Satellite Business Systems satellite was used for the long-distance link to New York. A New York cable company then provided distribution via coaxial cable throughout Manhattan. The experiment was a great success.

San Francisco was selected to test DTS because of its hills and fog. On the average, there was less than one bit error in 100 million bits, and there were periods with as few as one bit error in 100 billion bits. The experiment also demonstrated that both DTS and coaxial cable could be integrated into a digital electronic message service system.

In spite of its success, the cost of digital termination service hardware was higher than Xerox had originally estimated. In the early '80s, Xerox faced a variety of competitive threats and opportunities. Xerox pulled out of Xten, but left an exciting technology to a competitive marketplace.

Digital termination service microwave communications networks operate in the familiar central office configuration used by the telephone companies. A DTS network will employ a series of local central offices that will be interconnected (see figure at left). These central offices may also be connected to any long-distance network. Some customers will require long-distance interconnect. As an added service, the digital termination service carrier may buy transmission capacity from the long-distance company and resell the service to the customer.

At each customer location, the digital termination service carrier will install microwave equipment. The customer will have an antenna aimed at the local central office, a high-frequency, two-way radio and an interface to the customer's communicating business equipment. The customer antenna will be two-, four- or six feet in diameter. The two-foot unit is small enough to operate from the window of an office building, while the four-foot and six-foot units are generally roof-mounted. The equipment interface at the customer premise allows the connection of up to 24 devices. The customer equipment may be shared by tenants in the same building by assigning connections to each party. The ability to share customer equipment among several customers will result in substantial economies.

DTS require a line-of-sight path between a subscriber and the central office. In most cities, one central office is sufficient to cover most of the downtown area if that location is properly selected. Alternate technologies, like cable, can be used to pick up a subscriber location off the line of sight. Furthermore, DTS central offices can be constructed in cells to serve a wider geographic area or wherever terrain or skyline is highly irregular.

The FCC has set aside DTS frequencies for both extended and limited carriers. An extended carrier must serve 30 or more cities and must commence services within five years of license approval. A limited carrier can offer service in up to 27 sites, but must begin services within 2½ years of approval. An extended carrier is granted 10 MHz of spectrum (5

MHz in each direction). A limited carrier is granted only half as much bandwidth, and there is room for seven extended carriers and six limited carriers in each city.

The traditional telephone company plant does not offer the high speeds, flexibility and format needed to support all of a modern company's message and data requirements. High-speed digital service is expensive, and in some cities, it is not available. Where it is available, lead times may be long, and a year's wait is not uncommon. Changes to digital services can be lengthy and expensive. DTS are still generally unavailable, but as services come on stream, DTS will be an attractive choice for many subscribers.

The all-digital transmission system to be used in DTS is well-suited for data communications. Because the latest office automation and video and videographics teleconferencing equipment uses digital technology, all-digital DTS networks will provide similar advantages for these applications. A variety of communications needs will be met within a single integrated system.

automation and video and videographics teleconferencing equipment uses digital technology, all-digital DTS networks will provide similar advantages for these applications. A variety of communications needs will be met within a single integrated system.

Customers will also benefit from the high speeds available using the DTS networks. This means data can be transmitted at speeds of up to 1.54M bit/sec, documents can be transferred at the rate of 30 pages per second and two-way compressed full-motion video can be achieved, all using the same transmission facility. Customers may schedule these activities internally to use one channel simultaneously for any combination of these applications, either as a dedicated high-speed facility or on a measured service basis.

Until recently, the cost of delivering a voice circuit to a private-line customer via DTS was too high to allow digital termination services carriers' networks to compete in the voice market.

ONE OF THE AUthors, Walter Ulrich, regularly polls audiences at conferences where he is a speaker. For years, most communications managers have admitted that they cannot project their communications costs. DTS and other alternative technologies offer an opportunity for the communications manager to negotiate and control his costs for the first time.

DTS will deliver three kinds of services. First, they will be used to provide dedicated, full-time, private-line telecommunications services. Leased digital services will range from 2,400 bit/sec to T-1 (1.54M bit/sec).

Second, DTS will provide groups of 24 local voice trunk or access lines. Some corporations, government, other common carriers and long-distance resellers have heavy voice message traffic among multiple locations. These customers are either paying the Bell operating companies for those services now or are awaiting delivery of circuits. DTS are an economically attractive alternative that will be readily available in some locations.

Third, DTS networks can also provide measured service. With measured service, a customer is charged only for actual network use. Measured service is valuable to customers that have heavy peak traffic but very little traffic at other times. Typical applications for measured high-speed service are computer backup, mass file transfer, remote laser printing and high-speed facsimile.

There are four primary applications for local loop traffic: data communications, voice communications, video and videographics teleconferencing and office automation communications.

The quality, flexibility and availability of digital metropolitan private-line service is inadequate in most cities. Existing analog transmission systems require expensive modems to convert digital signals to analog and back to digital. The all-digital transmission system to be used in DTS is well-suited for data communications. Because the latest office

Digital Termination Systems

However, improved efficiency of the microwave systems and reduced unit prices have made DTS private-line offerings attractive in groups of 24 or 48 lines. A DTS carrier can currently provide up to 16 groups of 48 lines from a single central office.

As the efficiency of the microwave systems has increased, the cost of the systems has declined. When the two phenomena are analyzed together, there is a dramatic tenfold or greater reduction in a DTS carrier's cost to deliver transmission capacity — and that has occurred in the brief span of two years. Additional price/performance improvements are on the horizon.

Further advances in digital voice technology are imminent. The standard for digital voice transmission is 64K bit/sec. Recently, there has been movement to a 32K bit/sec standard. That means a conversation under the new standard requires only half the transmission capacity of the 64K bit/sec standard. With each advance in voice digitization, the cost of DTS voice circuits declines and becomes more competitive with analog voice delivery provided by the Bell operating companies. Prototype equipment already exists to allow voice transmission at 9,600 bit/sec. Technologies for high compression are expected to become commercially available within the next few years. When combined with further improvements in microwave efficiency and reduced cost of systems, the compression technologies foretell a solid future for DTS microwave digital voice service.

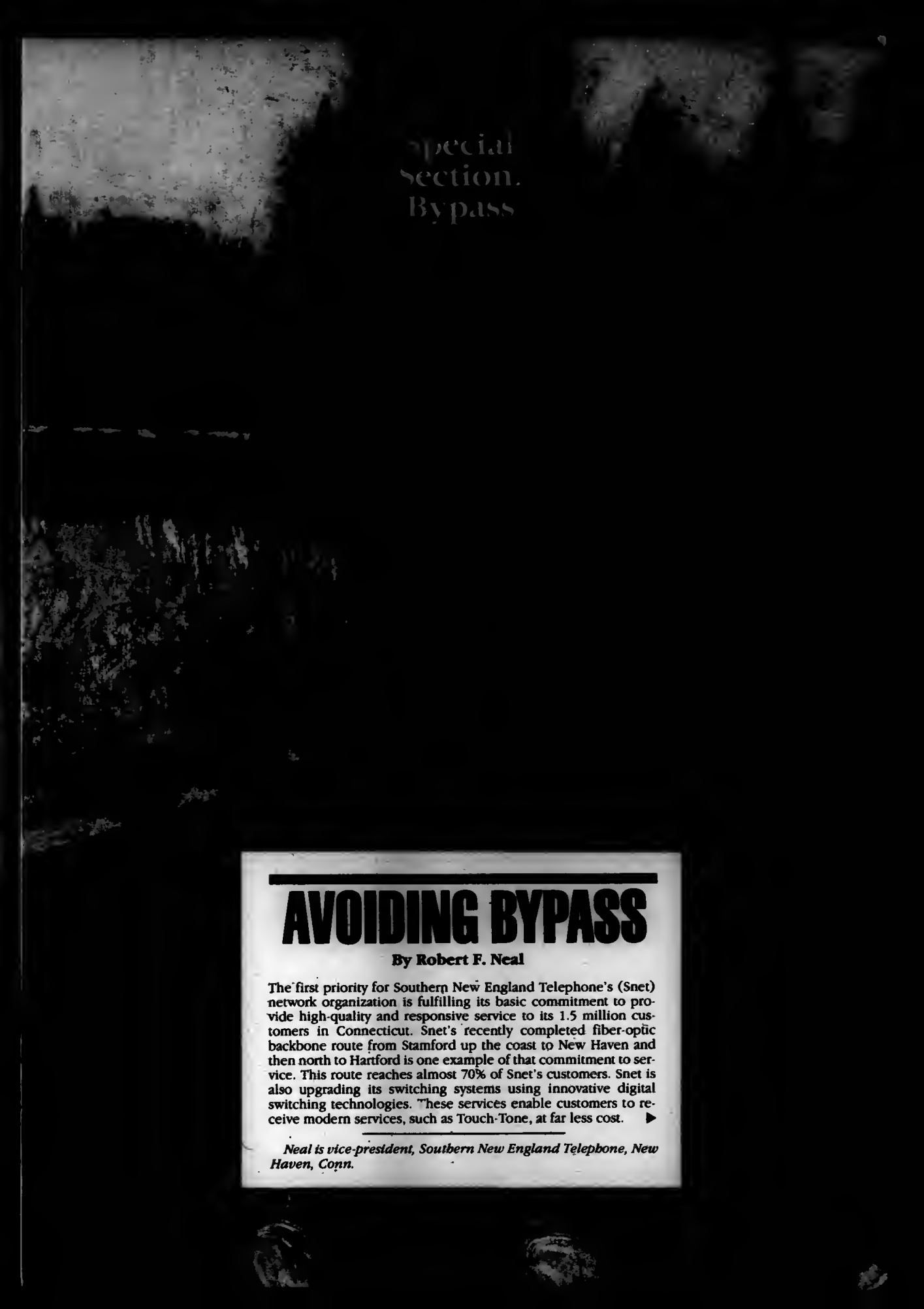
The year 1984 is the dawn of a new age in communications. The economics of the '70s are ancient history. Communications networks must be reengineered and optimized for the new economic realities. Companies that ignore new communications methods will face ever-increasing communications costs. Smart managers will recognize that communications changes must be made.

OFFICE AUTOMATION is based on digital technology and requires rapid information transfer. Examples include high-speed facsimile, communicating copiers, communicating word processors, laser printers and communicating document scanners. DTS are suitable for high-speed office automation applications.

Video and videographics teleconferencing refers to the use of video, audio and graphics communications techniques to enable effective meetings to be held among participants separated by as little as a mile. Studies published by the Stanford Research institute indicate that 20% of all business travel might be eliminated without loss of efficiency if teleconferencing services were available. This represents a potential savings of several billion dollars per year in travel time and expense. The National Aeronautics and Space Administration, for example, has recorded savings in excess of 20% of its travel time and expense. DTS accommodate a variety of conferencing systems and will handle full-motion videoconferencing in the local loop.

The year 1984 is the dawn of a new age in communications. The economics of the '70s are ancient history. Communications networks must be reengineered and optimized for the new economic realities. Companies that ignore new communications methods will face ever-increasing communications costs. Smart managers will recognize that communications changes must be made. New hardware, new technologies and new services will be evaluated and applied. It is a complex arena, but many companies will sharply reduce their communications cost per unit.

Communications concepts over long distance are better understood by most people. It is in the local loop, however, that the cost increases and bottlenecks are likely to occur. DTS technology holds the promise for reducing the costs and eliminating the bottlenecks. It is an important technology that deserves careful consideration in any well-thought-out communications strategy. ■



AVOIDING BYPASS

By Robert F. Neal

The first priority for Southern New England Telephone's (Snet) network organization is fulfilling its basic commitment to provide high-quality and responsive service to its 1.5 million customers in Connecticut. Snet's recently completed fiber-optic backbone route from Stamford up the coast to New Haven and then north to Hartford is one example of that commitment to service. This route reaches almost 70% of Snet's customers. Snet is also upgrading its switching systems using innovative digital switching technologies. These services enable customers to receive modern services, such as Touch-Tone, at far less cost. ▶

Neal is vice-president, Southern New England Telephone, New Haven, Conn.

Avoiding Bypass

Facing unprecedented industry change — including deregulation, the impact of new technologies, strong growth in network use and increasing customer pressure for more cost control — Snet needed to align its network marketing organization to operate in a competitive environment. To do this, it structured its operations around two key groups of customers.

The first group consists of the more than one dozen interexchange carriers in Connecticut that generate a significant percentage of Snet's total network revenue. The second market segment is composed of Snet's top business accounts in Connecticut. This segment represents a small percentage of the business market, yet, like the interexchange carriers, it generates a large portion of network business revenue.

Today, Snet faces the possibility that these two market segments might get together and decide to do business without it. This is known as bypass. Simply put, bypass is the use of telecommunications facilities or services for transmission of voice, data or video telecommunications services in lieu of the services traditionally provided by the local telephone company.

Southern New England Telephone

If its key customers should choose alternative networks, and Snet sees this as a real threat, increased pressure would be put on rates for local exchange services.

The growth of bypass has some compelling forces behind it. For interexchange carriers, there are pressures to reduce operating costs, of which access charges are the largest part. There are also pressures to gain more control over their services, to try new technologies and establish stronger market positions. But there are also reasons inhibiting interexchange carriers from bypass, including the risks associated with large capital outlays and of obsoleting and stranding those investments. These carriers are also concerned about increased expense associated with a labor-intensive maintenance force.

For Snet's other key market, the top business customers, the incentives to bypass include the need to control telecommunications expenses, a desire for flexibility and a wish to participate in opportunities associated with new technologies. These top business customers all want a telecommunications supplier that is responsive and easy to do business with.

There are also reasons holding large businesses back from bypass. These include a reluctance to commit to one system when a host of options exist, a desire to wait and see what happens with political questions concerning access charges and bypass taxes and the lack of internal telecommunications expertise.

Snet intends to address these crosscurrents by providing value to both market segments. To do this, it created two new divisions in its network organization.

One is the telecommunications carrier services division. This group is Snet's interface with interexchange carriers and is responsible for developing a line of services that will be valuable to them. To meet this objective, Snet is learning as much as possible about the businesses of these customers. The better Snet understands how they operate, what their needs are and what their business problems are, the more value it can add to its network services for them.

To this end, Snet is strategically deploying technology based on demand and costs, providing service options to carriers and closely examining its interstate cost structure. With that information, Snet will determine how it can solve interexchange carriers' problems and meet their service needs.

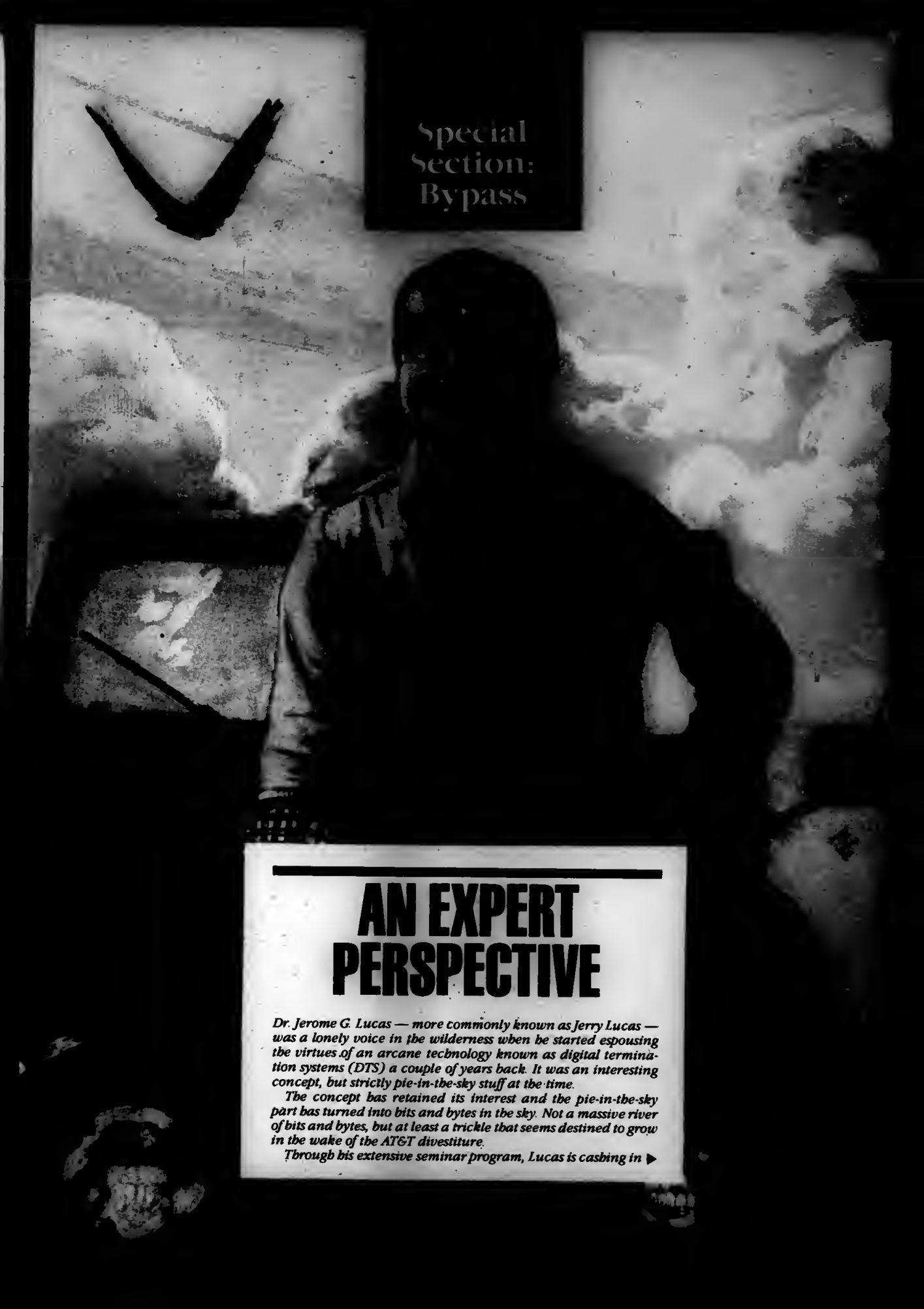
The company aims to offer services that will enable carriers to run their businesses better. The next step is to sell those services successfully to the carriers.

Another group Snet created is Sonecor Network Sales. It focuses on the entire Connecticut business market, with specific emphasis on those top customers that generate a large share of business revenue.

Sonecor Network Services is developing strategic account plans targeted to top customers' needs. The network sales group exists to solve the problems of large business customers and help them find better ways to conduct business through innovative, customized use of services.

It also meets their needs for new services. The network sales group aims to make it easy to do business with them. This is one of Snet's top priorities.

Snet is creating new services, opening up new opportunities, and moving in new directions. It is working to make its services more valuable to its key customers. As a result, Snet is confident that customers will not choose a bypass alternative as long as it can show them that it clearly offers more value. ■



Special Section: Bypass

AN EXPERT PERSPECTIVE

Dr. Jerome G. Lucas — more commonly known as Jerry Lucas — was a lonely voice in the wilderness when he started espousing the virtues of an arcane technology known as digital termination systems (DTS) a couple of years back. It was an interesting concept, but strictly pie-in-the-sky stuff at the time.

The concept has retained its interest and the pie-in-the-sky part has turned into bits and bytes in the sky. Not a massive river of bits and bytes, but at least a trickle that seems destined to grow in the wake of the AT&T divestiture.

Through his extensive seminar program, Lucas is cashing in ▶

Jerry Lucas

on the growth of DTS and a wealth of other new or reborn technologies such as telephone bypass, multitenant private branch exchange sharing and two-way cable television. It's all very state of the art and still somewhat futuristic, but users and potential users are paying to learn more.

Recently, Computerworld On Communications *Editor Bruce Hoard interviewed Lucas, who is the voluble president of McLean, Va.-based Telestrategies, Inc. The subject of the interview was telephone bypass.*

What is bypass technology, and how did it become popular?
Bypass technology is a collection of technological alternatives to twisted-wire pair — basically, system approaches that can bypass the traditional telephone company plant. Bypass does not mean that the local telephone companies cannot participate in these technologies, because they do. It is these new technologies that are replacing the traditional wired-pair distribution plant provided by the local phone company.

How many bypass technologies are there?
There are five major ones: first, digital microwave; second, cable TV; third, digital termination services; fourth, satellite technology; and fifth, mobile communications.

Could you briefly describe how each of these works?
Digital microwave is the near-term bypass threat. Digital microwave is microwave frequency bands that are uncongested and open to interexchange carriers and end users for immediate applications. These frequency bands are generally 18 GHz and 24 GHz. The kind of bypass that you can perform there is bypass from customer location directly into an interexchange carrier — in other words, from a building directly into a point of presence of an interexchange carrier.

How does cable TV work as a bypass medium?
Cable TV can be modified for two-way transmission. This can be cable TV services in the business community only, in which case you would call it an institutional network, or it can be cable TV in the residential area, which provides two-way services to the home.

Please describe digital termination systems.
Digital termination systems have a special frequency band the [Federal Communications Commission] opened for digital electronic message services. It is low capacity compared to the digital microwave, but it is very much related to microwave. This is where the operator carrier would have a central facility with line of sight to rooftops, and the operator would provide a point-to-point or switched access between two points in a city or to access interexchange carrier networks.

How about satellites?
The fourth bypass technology is satellite communications, obviously with rooftop antennae, primarily end to end.

And mobile communications?
In the past two years, the FCC has opened a number of local frequencies for two-way services. For example, mobile cellular radio telephone can be used as a bypass method for local exchange services and a bypass method for short-distance toll calls and also for public phone use.

Are there any other bypass technologies?
There are miscellaneous ones that are not as important in the near term. They include privately constructed optical-fiber networks. That is one in which the local telephone systems will likely be a heavy participant. And then you can use other very, very esoteric bypass technologies, such as infrared systems, which are used in some applications, and paging. When you take these technologies and put them into a service, they can take other forms — for example, teleports with the business approaches to bypass technology and intelligent buildings.

Who is using bypass technology, and who can afford to use it?
The major users of bypass technology today are large Fortune 500 companies that are looking to put in regional networks and national networks. They can realize extremely fast payback by putting in their own microwave — for example, Westinghouse [Electric Corp.] and McDonnell Douglas [Automation Co.]. They can save $30 million or $40 million over a several year period by putting in bypass microwave.

The second user today, one that you don't hear a lot about, is state government. There are at least a dozen state governments that are putting in bypass systems that can be very sophisticated. Kansas is in the final stages of planning a fiber-optic network that reaches over 100 miles to link its various locations.

The third group, which is not as extensive now because it is waiting for the right political climate, is the interexchange carriers.

They are looking to bypass directly from their point of presence to the end user.

Who will be the heaviest bypass user?
In the long run, the most extensive use of bypass for the remainder of the '80s will be from intelligent buildings to points of presence. Intelligent buildings are buildings in which the owner or developer puts in his own private branch exchange and begins to provide long-distance telephone resale to the tenants in the building.

The economies of multitenant telecommunications are staggering. For every square foot of office space, you will see from $3 to $5 of long-distance telephone calls originating. When you see a giant skyscraper with one million square feet of office space, you're seeing up to $5 million of long-distance calls originate in that building. With that concentration of long-distance traffic, you can afford bypass technologies and go right from the building to a long-distance carrier, thereby bypassing the local phone company.

What are the pros and cons of a bypass tax?
The tax obviously is a subsidy. Somebody is getting subsidized; it's not really a tax. When you say bypass, you're really talking about creating a revenue stream for the local telephone company.

And what's your opinion of that?
In the end, I think it's going to be very difficult to enforce. And, in fact, it would probably have a negative effect. A bypass tax would probably be so darned minimal that larger companies would probably say "My gosh, I might just as well take advantage of it now and do it." In the end, you would probably create more bypass than you would have normally. It would probably stimulate uneconomic bypass because the subsidy payment would not do a very good job and would just create a lot of loopholes for others to get into the business.

What questions are you asked most frequently about bypass?
The question asked most frequently is, "Who are the bypassers?" That is number one. The next is, "How much money today is lost to bypass?" Number three is, "How big is the long-term marketplace for bypass?" Number four is, "What should the Bell operating companies do in regard to bypass?" And, number five is, "Will AT&T Communications be a bypasser?"

You already talked about who the bypassers are. How much money today is lost to bypass?
If you took all the bypass traffic right now and put it back on public systems, you would see an increase of about $700 million this year in revenue that would go back to the local telephone companies.

What is the long-term market for bypass?
Within 10 years, you're looking at a $10-billion industry, and that's [redacted].

"A bypass tax would probably be so darned minimal that larger companies would probably say 'My gosh, I might just as well take advantage of it now and do it.'"

just in local bypass, not long distance. These are revenues that would be taken off the twisted-wire pair and would go to other technologies. Now, the local telephone company will be a significant participant in that.

What else will the local operating companies do about bypass?
They will come up with a bypass strategy where they are bypassing themselves. They don't have faith in the regulatory and legislative process, to the extent that they believe bypass will be outlawed. They do not want to lose the customers. Once you lose the customers to bypass, it is virtually impossible to get them back.

What is AT&T going to do?
I think they'll be heavily involved in bypass, probably about two years from now. I think they will wait until other interexchange carriers get heavily involved in it to show that there is indeed competition. I suspect they will make the case that they have to bypass in order to be competitive.

They will extensively bypass in every state. Forty percent of long-distance calls either originate or terminate in 100 square miles of the country. For example, in New York City, there are roughly 160 million square feet of office space from midtown to lower Manhattan. Office space is highly concentrated. Within those 100 square miles, AT&T is generally within one-half mile of every office space. ■

DP MOVES INTO DATACOM

BY KATHERINE HAFNER

For large computer vendors hitherto unschooled in the ways of communications, the '80s are something of an epiphany. Driven by customer demand, technical requirements and IBM's ubiquity, computer companies now integrate a wide range of communications capabilities in their product lines. In the past 18 months, computer companies have burst into high gear and established relations of one sort or another with switch vendors for private branch exchange (PBX) development. In addition to outside liaisons with PBX vendors, computer companies have quickened the pace of in-house development of their communications products and facilities.

One computer vendor that has embraced communications unequivocally is Wang Laboratories, Inc., the $1.5-billion company that was founded as a specialty electronics firm by Chinese physicist An Wang in 1951. Perceived today as the world's leading office automation vendor, Wang has made no secret that communications, in the broadest sense of the word, is to be its key to future growth. According to a a study published recently by Predicasts, Inc., communications products generated an estimated 5% of Wang's revenues in 1983. And this is just a glimpse of things to come.

Late last year, Wang emerged with a spate of communications-related announcements: its own version of IBM's protocol Systems Network Architecture (SNA) called Wang Systems Networking, a set of networking products to link Wang systems with those of other vendors; Wang Office, a series of network-based software options for Wang computers; and the Information Distribution System software products, said to provide a gateway between Wang VS systems and an IBM or IBM plug-

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Hafner is senior writer for Computerworld On Communications.

SCULPTURE BY RALPH HELMICK "COMING BEGINS" COURTESY STUX GALLERY

compatible host over IBM's 3270 SNA or IBM's protocol Binary Synchronous Communications. In addition, Wang announced last November its intention to produce an interface between Wang Office and IBM's Distributed Office Support System (Disoss).

Perhaps the most dramatic proof of Wang's commitment to communications was its investment, this April, in 15% of Intecom, Inc., the manufacturer of the Integrated Business Exchange (IBX). Wang's move mirrors that of IBM: A year ago, Big Blue bought 15% of Rolm Corp., which manufactures the Computerized Branch Exchange digital PBX. IBM's stake in Rolm now equals 22.7% and can rise to as high as 30%.

Unlike IBM, which has remained vague about its plans ▶

DP Moves Into Datacom

for the Rolm switch, Wang immediately offered some specifics: Scrapping its in-house PBX development, Wang will work with Intecom to design an interface between Wang computers and the IBX that will allow information exchange among Wang systems via the Intecom switch. In their nonexclusive relationship, the two companies also plan to develop communications products that would allow the integration of Wang computers and peripherals with the IBX.

In April, Wang announced Fastlan, a broadband networking alternative to the company's flagging Wangnet local-area network. Targeted at small and medium-size businesses that do not want the full Wangnet network all at once, Fastlan is said to allow for modular installation of Wangnet.

Wang has also reached out to such companies as U.S. Satellite Systems, Inc. and Bolt, Beranek and Newman, Inc. In late 1982, Wang acquired a minority ownership in and satellite transponder capabilities from the satellite company. And last summer, Wang signed an agreement with Bolt, Beranek and Newman to have the Cambridge, Mass.-based consulting and engineering company design and build a packet-switched value-added network for Wang. Within a year, the value-added network will be available for Wang's internal use, and it will be made available to Wang customers about a year later.

"The office doesn't end at the wall or the building. It goes nationwide or worldwide," Thomas Mercer, Wang's director of communications systems, said. "Our objective is to link users in as transparent a fashion as possible. In order to do that, Wang has to become a very sophisticated data communications and networking vendor."

Despite good intentions, however, many of Wang's announcements have yet to see the light of day. "Wang is certainly a leader in communications, but the company has a long history of announcing products when they are just in the conceptual stage," said Lawrence Vogel of the Office Systems Consulting Group, Inc. in Cambridge, Mass. "Disoss compatibility is something that is very difficult to achieve for a vendor that is not close to IBM, and I think Wang will have problems."

On the other hand, Digital Equipment Corp., according to Vogel, "has a lot more irons in the fire" than Wang when it comes to communications capabilities. The minicomputer vendor, whose financial landscape of late resembles the Rocky Mountains, has remained steady in its introduction of communications capabilities in and around its products.

"DEC is basically in the distributed processing business and has been ever since we started," John Adams, DEC's strategic planning manager, said. "That means DEC has always been in the networking business. Once you take the step into distributed processing, sooner or later, you'll take the step into networking."

DEC's involvement in communications — from videotex to CPU-to-PBX interfaces — is as wide-ranging as its computer products. Decnet, DEC's local net, is that firm's communications backbone for short-haul links. DEC is now shipping Phase IV of

DEC, whose financial landscape of late resembles the Rocky Mountains, has remained steady in its introduction of communications capabilities in its products.

Decnet, which is said to be capable of supporting large networks with adaptive routing mechanisms to isolate failures in the network and route around them.

Adams estimated that half the VAX superminicomputers the company ships are sold with some kind of networking software, either IBM protocols or Decnet. "Slowly but surely, networking has moved from being something that only our more sophisticated customers use to connect their computers, to something that the vast majority use," Adams said.

DEC has also taken the lead in multivendor compatibility with its participation in this April's agreement among 13 companies to support the IEEE 802.4 broadband token-bus local-area network and IEEE 802.2 data link control standards. At the July 1984 National Computer Conference in Las Vegas, DEC will participate in a multivendor demonstration alongside others such as IBM, Hewlett-Packard Co. and Intel Corp.

According to the Predicasts study, sales and rentals of voice and data communications-related equipment accounted for an estimated 10% of DEC's total corporate revenues of $4.3 billion in fiscal 1983.

But conspicuously absent from DEC's communications roster are the types of deals with PBX manufacturers now gracing the balance

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sheets of IBM and Wang. For its part, DEC has worked with Northern Telecom, Inc. to develop a Computer-to-PBX interface (CPI), which competes with AT&T's Digital Multiplexed Interface (see "Pro and Con," Page 7).

The CPI, which was demonstrated at Interface '84 in March, consists of circuit boards in DEC hardware and the Northern Telecom SL-1 digital switch. In addition, Rolm, Mitel, Inc. and Intecom have plans for developing the same interface.

Despite the arrangement with Northern Telecom, DEC is maintaining its distance from full PBX development. "The funny thing about a PBX today is that a PBX does voice," Adams said. "We have never been in the voice business. We're in the data communications business today."

Adams maintained that despite the ballyhoo surrounding voice and data integration, there is "very little incentive for the customer to mix voice and data. It is more costly to combine voice and data than it is to run separate networks." Therefore, in short-haul links, he said, a more cost-effective solution is to maintain separate networks for voice and data, using a PBX for voice and a local-area network for data.

"Many people purchasing PBXs today are not purchasing the data option," Adams said. "What's really going on in the PBX world is that the data option is being used as a marketing tool to help telecommunications managers avoid risk. If they have a need to use data, they have the ability to expand with the system. But if you look at the people building data networks and voice networks, you'll discover they're separate."

HOWEVER, IN THE opinion of some, DEC's failure to extend beyond a joint venture could prove perilous. "In light of the Wang-Intecom and IBM-Rolm deals, I see vendors without concrete PBX ties in a risky situation," George Colony, president of Forrester Research, Inc., said. "You can only have so many joint ventures before you require true technology exchange.

"Northern Telecom and DEC are going to be in competition in two years, because the PBX vendors are on a collision course with computer vendors."

"We are not in the business of providing communications facilities," Adams said. "Our objective has been to build a product set that allows the network manager to pick the communications facilities that give him the most cost-effective network and the flexibility to make a change at any time."

Similar to DEC in its tentative approach to PBX development is Prime Computer, Inc. Prime, whose 1983 revenues were $516 million, has publicly announced an agreement with Northern Telecom to purchase license rights to its switch and is carrying on "discussions" with AT&T, Rolm, Mitel and Intecom.

Still, the Natick, Mass.-based minicomputer vendor claims its approach is geared to customer demand. "Our strategy for PBX interconnect says we're not going to go out to a customer and sell him a PBX," said Barry Burke, Prime's product marketing manager for local-area communications. "Customers rarely ask a computer vendor what PBX they should purchase. Rather, the customer says, 'We have a certain PBX and want to hook your equipment to it.' That leaves us with only one choice: to be able to connect and coexist with as many PBXs as possible."

Prime was one of the earliest proponents of X.25 protocol in the U.S. and, in that respect, is considered to have been well ahead of its time. For its place in the computer industry as a distributed data processing company, analysts believe Prime has done a noteworthy job of integrating communications into its own products. But with such a strong emphasis on proprietary communications nets, Prime may well find itself haunted by the past.

"Relative to companies like DEC and Wang, the bright points for Prime in communications are few and far between," Colony said. "The world is a lot more complex than just tying together proprietary minicomputers. If Prime continues to be a straight distributed processing shop, then it may not be inappropriate for its current strategy, but it won't gain them anything in the near future."

Prime recently announced an agreement with Vitalink Communications Corp., a satellite company, whereby Vitalink will provide satellite communications services to Prime customers using Primenet software.

Burke considers communications to have been "the basis" of the company since 1977, with the development of its remote job entry products. According to Burke, Prime's capabilities in Prime-to-Prime communications have often proven pivotal in making a sale.

"Our approach is strictly a survival instinct," Burke conceded. "We don't go in and try to replace systems or kick things out. We try to coexist." ■

GLOBAL INFORMATION POLICIES

BY STEVE MOORE

Information seldom appears as an expense category on corporate balance sheets today, but it may dominate them by the year 2000. In an increasingly information-based world economy, information costs can no longer be submerged in overhead accounts or lumped together with other expenses; they constitute a growing slice of the corporate expense pie. Although aware of the importance of information policy issues, U.S. leaders in the private sector and government alike seem unable to throw away their humpty-dumpty strategy of waiting passively until the actions of others threaten the status quo, then attempting to patch things together again.

Even as we pass through 1984 with a sense of relief that the world of George Orwell's *1984* is not ours, five crucial trends are combining in ways that have the potential to shape international communications along Orwellian lines: the treatment of information as a commodity, the digitization of all information, the emergence of a global market virtually independent of national markets, private ownership of much that was once public information and a tendency to put more trust in market forces than in representative government. Understanding these trends may be helpful to information systems managers and others who must accurately anticipate their communications needs as the world rushes headlong into the Information Age — and who must begin now to combat restrictive policies before they are put in place.

Governments worldwide have belatedly realized what most business leaders already knew: Information is no longer an intrinsically valueless adjunct to other commodities; it is a commodity. Trade in information has become one of the primary determinants of global trade balances, and some countries are considering ▶

Moore is staff writer for the Alpha Micro Users Society, Boulder, Co.

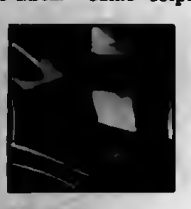
taxation of information flow in order to improve their trade positions while simultaneously tapping a new, potentially mammoth source of revenue.

The rationale for an information tax is that the application of tariffs and other trade restrictions to information exchanges is a reasonable and consistent extension of international trade practices routinely applied to physical goods such as textiles and automobiles. No policies are in place that specifically tax trade in information, but proposals for doing so are being seriously considered in France and Brazil. Corporations and governments worldwide are watching those countries closely. A system for quantifying, classifying and taxing information traffic at gateways through which all incoming and outgoing transmissions would pass has been proposed by Alain Madec, chairman of the French Commission of Transborder Data Flows.

The effect of information taxes would be catastrophic on businesses that depend on quick, competitively priced international communications. The cost of doing business for the banking, credit card, travel and data base service industries could increase as much as 500%. Most current governmental restrictions of information flow ostensibly protect the privacy of individuals and the national security or cultural sovereignty of states. These are legitimate concerns, but it is difficult to determine how much of the motivation for such restrictions springs from the bottom line: protection of national business interests.

Some nations, including Canada, West Germany, Mexico and Brazil, have unabashedly enacted protectionist legislation aimed at strengthening their national information industries. Proliferating and inconsistent laws affecting each segment of the information industry — hardware, software, telecommunications and data base services — have created difficulties for multinational corporations.

The principal international trade organization, the General Agreement on Tariffs and Trade (GATT), is under intense pressure to add trade in services, including information services, to its policy deliberations. GATT policies have traditionally been hammered out laboriously over long periods of time, and that process will not serve now. International information trade negotiations must begin immediately to avert the disruptive chaos threatened by uncoordinated unilateral restrictions in a world driven by accelerating new information technologies.



Combine the possibility of different information taxes for entry in various national markets with the further possibility that usage-sensitive pricing may be selectively imposed on users of some international telecommunications links. Add the specter of secret police monitoring incoming and outgoing data traffic at international gateways in the name of national security, and the Orwellian nightmare is complete.

If positive, coherent and flexible international telecommunications policies are not formulated now, equitable development of global information networks could be set back for decades. The acid test of the potential for international cooperation on information policy will be whether agreement can be reached on technical standards for the proposed integrated services digital network (ISDN). If universal agreement among nations can be reached on purely technical grounds, hope will exist for agreement on political and economic issues.

The evolution of the ISDN will shape international communications for the rest of this century. The ISDN will be an all-digital telecommunications network with the capability to transmit interactively information of any type anywhere in the world via the most efficient combinations of transmission media. Thus, all information or data may soon be communicated in the same form (digital) over the same combinations of pathways (the ISDN). Different types of information, such as computer programs, news stories, financial transactions and raw scientific data, will be indistinguishable from each other while in transit, making it meaningless to distinguish between data flow and information flow.

If information communicated by corporations, private individuals, governments, broadcast and print media and commercial computer networks is transmitted in the same form over the same pathways, its regulation on both national and international levels may become homogeneous where it has previously been diverse. It will be difficult to formulate regulatory policies that satisfy all categories of international telecommunications users.

The design of existing international communications networks has been determined by those that needed them first. Today, the dominant users of international communications are banks, airlines, manufacturing companies, the media and governments. Some corporations have developed their own private international networks in order to coordinate operations on a global scale.

For many multinational companies, there is no domestic market separate from the international market. Operations, personnel and capital are shifted from point to point around the globe in response to purely corporate imperatives. Control of private communications networks provides the means for companies to bypass national policies of individual countries. Personnel in these firms can communicate instantaneously on a global scale and make decisions with only minimal regard to the purely national concerns of the individual countries within which they do business. Chief among the advantages of multinational corporations is their ability to gather information from sources all over the world, assemble it in mammoth data bases and then offer it, for a price, to others that need it. In the U.S., domestic and multinational information service companies are spearheading a successful attempt to limit the role of the government as an information provider, based on the now widely accepted premise that the government should not compete with the private sector.

Exponential growth in the collection, organization and dissemination of information, fueled by computer data base technology, is polarizing government and the private sector on the issue of who has what rights to information that is generated by government. It also raises the issue of which information functions should be handled by government and which should be handled by the private sector.

One argument is that governments should continue to provide a necessary public service by making all information it generates, except for classified material, available to the general public free or at minimal cost. This would include scientific research, census data, information required of the private sector by government regulatory agencies such as the Federal Communications Commission (FCC) and information generated by government-paid consultants. Government information is made available to the public through the Government Printing Office, the National Technical Information Service and the national depository library system.

The opposing argument is that since information is now a valuable commodity, the government should neither give it away nor sell it and, thus, compete with the private sector.

On the contrary, most of the government's information functions should be delegated to private sector information and data base services, which, after supplying the government with information it paid for, would own all further rights to the information and would market it for profit.

The perception of information as a commodity to be sold and the idea that the private sector should assume many government functions are closely related to a more general trend toward reliance on the marketplace, rather than on government, to determine the shape of the world's information and communications services.

The argument for deregulation of telecommunications is based on the belief that in a freely competitive information and communications marketplace, the most efficient systems and the most beneficial uses of those systems will prevail. This is the model that the U.S. is attempting to export to the rest of the world, particularly Europe. The deregulatory model is questioned in the U.S. and elsewhere by those who consider government telecommunications regulation necessary to avoid a chaos of unfair access to and unrestricted profits taken from a crucial public communications resouree. Critics of the current deregulatory climate see it as evidence of a general attitude of excessive suspicion and mistrust of representative government that will backfire when the market is left to those who look only to the bottom line on quarterly reports.

The trend within the U.S. is toward deregulation, as evidenced by the AT&T divestiture and recent FCC decisions on common carrier resale and shared use, as well as broadcast licensing and station log requirements. The U.S. government is actively preparing a more cohesive policy stance and setting long-range goals in international telecommunications. However, industry and the general public cannot afford to assume that the government will act in its interest. Witness the foreign reaction to the FCC's premature attempt to export the U.S. competitive-deregulatory model by pushing for international resale and sharing of private leased telecommunications circuits. Foreign governments angrily responded with threats of volume-sensitive pricing or even elimination of private lines altogether.

Once a foreign government has put a policy into effect, even such a powerful corporation as IBM has little choice but to comply or pull out of the market. IBM acquiesced to Brazil's restrictive policies on computer hardware and software rather than give up on the market entirely, but decided to leave India rather than accept control by the Indian government. (Brazil cooperated with IBM because it is deeply in debt to U.S. banks.)

Giant multinationals can insulate themselves somewhat from the effects of various government information policies by shifting resources and priorities within their own private, satellite-based

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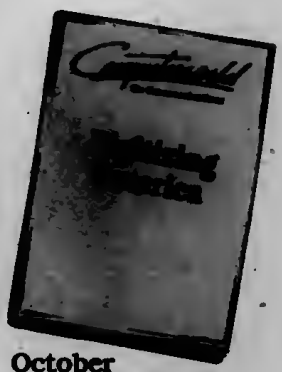

October

Communications networks are switching to all-digital. AT&T and MCI are using fiber-optic-based transmissions and satellite services. We'll explore how these changes affect users, and what the opportunities are for vendors.

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ISDNs. Smaller companies and the general public must immediately take three concurrent actions if they are to have any influence on the global telecommunications environment throughout its most crucial period of growth over the remaining years of this century.

First, they must keep close watch on domestic and international communications and information policy forums worldwide — in particular, the International Telecommunications Union, the Intergovernmental Bureau for Informatics, GATT and the United Nations.

Second, they must participate in existing telecommunications users groups and aggressively organize new groups that speak for those that vitally need access to telecommunications, but who do not have the resources to build their own systems or perhaps even to purchase or lease private lines. The only existing telecommunications industry associations, lobbies and governmental advisory councils with real clout are composed exclusively of representatives of Fortune 1,000 companies.

Third, they must recognize that the best way to broaden the base of support for low-cost, minimally regulated international telecommunications is to develop aggressively communications services aimed at the general public. Until now, corporate closed users group interests have been cloaked in the garb of the larger public interest. Corporate statements invoking the consumer and the public will no longer serve when dealing with foreign governments that are increasingly sensitive to such maneuvering. The true public interest must necessarily include the individual consumer and the small businessman as well as the Fortune 1,000.

New markets can be opened up and the public interest honestly served at the same time by vigorously developing videotex, electronic mail and other real-time, interactive mass-market consumer services. If specific provisions for such services are integrated in the ISDN as it is constructed, the individual consumer market potential will be gargantuan. Remember, it was the television home consumer market that sparked the growth of many of today's largest corporations. Enormous long-term gains can be realized from investment in a properly and equitably designed ISDN.

THE SOONER an international telecommunications infrastructure and services sector intended for universal access is developed, the sooner the myriad of new markets for new services can be tapped. And prompt policy formulation will have a positive effect on corporate investment in the ISDN, since many investors have held back because of the uncertainty of the regulatory climate.

Now, governments are free to tamper with information trade policies in the absence of any reasoned international agreements and without any fear of formal sanction for unilateral action. When the rules are decided, the players and the spectators will sort themselves out.

Skeptics who claim that the best way to deal with restrictive foreign information policies is to bypass them should remember that a determined government can control all media — as the Soviet Union has done for years. Such a determined government could certainly develop the technology to monitor or jam all information transmission media — including satellites.

Users of international communications networks, both public and private, have enjoyed efficient, low-cost worldwide communications for as long as such services have been available. However, this situation will not continue unless international agreements that provide benefits for all classes of users are reached as soon as possible. ■

NEW SHINE ON AN OLD SIGN

BY CHARLES ASKANAS

THIS MOST FAMOUS OF TERMINAL LINES IS BECOMING AN INTERNATIONAL STANDARD.

More than 12 years ago, IBM introduced the first generation of 3270 products, which comprises the single most significant and visible product line of interactive terminals, printers and controllers available to IBM system users. The past 12 years have seen three generations and a wealth of enhancements that placed 3270 products firmly within the largest corporate networks around the world. Presently, a significant trend is changing the fundamental nature of the 3270 market. This trend is taking the 3270 system out of its position as a specific product line and making it a universal protocol for interactive communications.

In March 1984, IBM announced that the IBM Personal Computer and Personal Computer XT could be used with IBM's 8100 system. IBM notified customers that the 8100 Personal Computer adapter kit would soon be available to attach Personal Computers to the 8100 system by remote or local communications loops. The kit allows the Personal Computer to emulate 3270 CRT terminals and the 3287 printer.

This recent announcement is just one of a long series of announcements from IBM, each moving toward establishing the 3270, the de facto standard for ▶

Askanas is chairman and president of Datastream Communications, Inc., Santa Clara, Calif.

New Shine on 3270

interactive communications, as a universal protocol. This 3270 protocol, combined with IBM's backbone architecture, Systems Network Architecture (SNA), is becoming the cornerstone of IBM's distributed data processing strategy. The unusually long life of the 3270 product line — that is, long for its industry — has contributed to its development as an industry standard.

There is substantial evidence that the 3270-SNA protocol will play a long-term role in IBM's networking strategy. Consider IBM's October 1983 announcement of the 3270 Personal Computer: This was the first networking alternative that IBM announced for its popular Personal Computer.

It is the start of a trend toward a broad range of related compatible offerings. These offerings include Personal Computer-to-host file transfer on SNA's Logical Unit 6.2. The Logical Unit 6.2, which may become part of 3270, is called advanced program-to-program communications and is used for general-purpose interprogram communications. In addition, these offerings will be broadened even further with the advent of the Document Interchange Architecture and Document Content Architecture.

These changes are impacting the way we look at the 3270 market. It can no longer be seen in terms of a number of printers, terminals and controllers. Furthermore, when one recognizes that 3270 has evolved as a protocol, the market for protocol converters can no longer be treated as a separate market, but rather as a segment of the 3270 market. The four distinct segments of the newly defined 3270 market are listed below:

- IBM and IBM plug-compatible 3270 products;
- Value-added 3270 products;
- Protocol converters;
- Network management and performance analysis.

Despite the fact that these segments relate to one another, they each have different characteristics, participants, sizes and growth rates. As a result, the individual characteristics and interrelationships of the four market segments must be examined in order to gain an understanding of the total 3270 market.

Before defining the market segments in detail, it is necessary to stress that the segments are not rigid. There is considerable overlap between segments, and the definitions may change rapidly. However, broad segmentation is appropriate for this year.

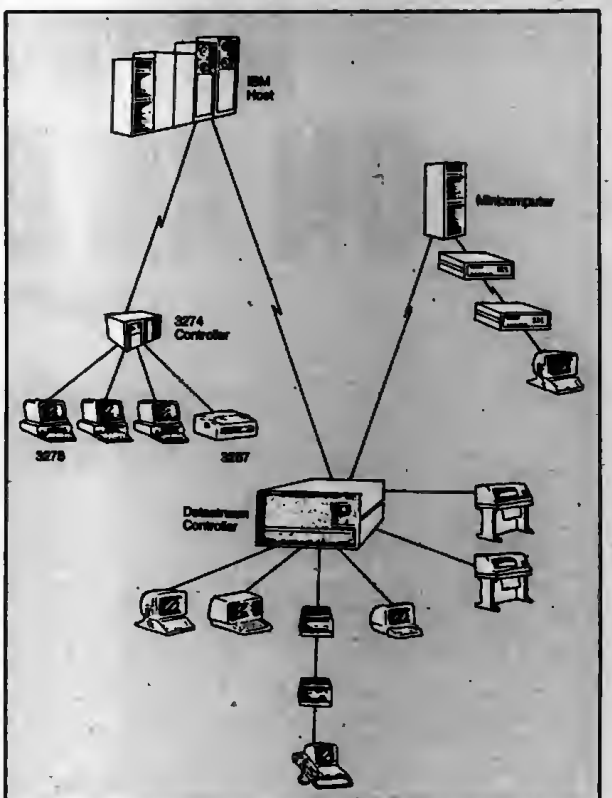
The first segment is the IBM and IBM plug-compatible segment. The products in this segment include IBM 3270 products or direct replacements for those products. Specifically, these are controllers that are local (directly attached to the host) or remote (connected to a communications controller). In addition, this segment also encompasses a range of terminals including the 3178; the 3278, 3279 and 3290; and the newly introduced Models 3179 and 3180. Printers are included as well.

The participants include, of course, IBM; ITT Courier Terminals Systems, Inc.; Harris Corp.; Telex Computer Products, Inc.; Memorex Corp.; and Raytheon Data Systems Co., among others. The market will reach approximately $1.5 billion in 1984, growing at an approximate 20% compounded annual rate, which includes sales of 3270 Personal Computers and Personal Computer XT 370s.

These products are sold as a system, which requires a direct sales organization. The complexity of the controller will probably increase as IBM adds hard disk and local-area network attachments. Furthermore, 3270 Personal Computer sales will increase at the expense of terminals.

There is substantial evidence that the 3270-SNA protocol will play a long-term role in IBM's networking strategy. Consider IBM's October 1983 announcement of the 3270 Personal Computer: This was the first networking alternative that IBM announced for its popular Personal Computer. It is the start of a trend toward a broad range of related compatible offerings. These offerings include Personal Computer-to-host file transfer on SNA's Logical Unit 6.2.

THE CONTROLLERS IN the second segment, the value-added 3270 market, offer full 3270 functionality including IMS compatibility, full support of Network Problem Determination Application, inbound and outbound pacing and availability of the printer authorization matrix. In



In this network, the controller permits remote terminals, printers and personal computers to access 3270 applications as well as concurrently communicate with minicomputers and one another.

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Now Shine on 3270

addition, the value-added market segment offers features such as networking and features and functions that benefit existing Ascii products.

The figure on Page 54 includes a specific networking example, in which the controller permits remote terminals, printers and personal computers to access 3270 applications as well as concurrently communicate with minicomputers and one another.

The products in this segment include Binary Synchronous Communications and SNA IBM 3274-compatible controllers and 3270-compatible terminals. They also include additional networking features such as the ability for attached terminals to access Ascii minicomputers, personal computers, voice and 3270 concurrently.

In addition, the participants in this segment include Lee Data Corp., Datastream Communications, Inc., Davox Communications Corp., Icot Corp. and Braegen Corp.

The market size was approximately $150 million in 1983 and is growing at a compounded 40% rate annually. This rate represents the growth of the 3270 market plus the growth opportunities realized by offering extended networking capabilities, including dial-in access to the full range of 3270 SNA capabilities.

The products in this segment offer systems and networking solutions, and as a result, they are sold through direct sales organizations. The capabilities of the products in this particular market will continue to be enhanced in order to provide additional network and workstation capabilities.

THE PRODucts in the next segment, the protocol conversion market, offer a variety of terminals, printers and personal computers to access limited direct or remote 3270 performance through dial-up connection to the protocol converter. The segment includes products with low to high — that is, two to 32 — port count. Protocol converter manufacturers usually offer additional products that provide access from Ascii devices to other networks, including X.25 and 5250.

This market also includes companies that provide boards that allow Personal Computers to emulate 3278 terminals and be connected to 3274 controllers.

The market size of the value-added segment was approximately $150 million in 1983 and is growing at a compounded 40% annual rate. This rate represents the growth of the 3270 market plus the growth opportunities realized by offering extended networking capabilities.

The participants in this market include Protocol Computers, Inc.; Micom-Systems, Inc.; Renex Corp.; Local Data, Inc.; Digital Communications Associates; Inc. and Forte Technology, Inc. The market size is approximately $75 million and is growing at a greater than 50% rate annually.

These products provide individual network component-type solutions such as modems, port contenders and multiplexers. Like those components, protocol converters are

usually sold through distributors.

The product offerings in this market will probably be expanded to cover additional protocols and, like all component offerings, will probably be characterized by significant price erosion.

The products in the next market, the network management segment, offer the customer statistical data that permits analysis of network activity, including a variety of response times, in order to determine network performance and problem areas. The products include host-resident software for network analysis and systems for graphic presentation of data as well as early notification of network overload.

The successful participants in the 3270 market will be the vendors that are best equipped to address the most important elements of each segment with integrated network solutions and those that offer the system flexibility that enables the customer to upgrade his network easily.

THE PARTICIPANTS include IBM, Avant-Garde Computing, Inc., Paradyne Corp. and Data Switch Corp., among others. The market size is approximately $100 million. It is a difficult market to size because many of the described offerings appear as segments of larger systems.

However, the customer needs are so great that the market must grow at a fast rate. The market is too new to determine the direction it will take. It is almost certain that the price-performance characteristics will rapidly improve.

Dividing the 3270 market into four segments is an attempt to identify the 3270 market elements and how they relate to one another. This market analysis applies to today's market. The definitions will change rapidly for a number of reasons, including the entry of new market participants or current participants moving into other segments.

Furthermore, IBM's product strategies determine the environment in which the 3270 protocol exists. Those product strategies are subject to a great deal of speculation. Questions include: What is IBM's local-area network strategy? How will the IBM local-area network interface with the next generation of 3274 controllers?

IN ADDITION, IT IS also necessary to understand what new market opportunities will exist as Logical Unit 6.2 becomes more dominant in program-to-program communications. And how will 3270 evolve as Distributed Office Support System capabilities increase?

The IBM 3270 environment is changing rapidly and so is the way in which we must look at the 3270 market.

The successful participants in this market will be the vendors that are best equipped to address the most important elements of each segment with unique, integrated network solutions and those that can offer the system flexibility that gives the customer the ability to upgrade his network as 3270 continues to change. ■

BELL COMMUNICATIONS RESEARCH GETS TECHNICAL FOR THE BOCs

BY IRWIN DORROS

Before divestiture, the Bell System companies established a tradition of quality service. Their networks, which they now use in the postdivestiture environment, are technologically complex and sophisticated. The key to the Bell operating companies' success in an increasingly competitive environment is their ability to build on their technological base, through continuing productivity increases and by introducing new, high-quality services.

Before divestiture, centralized, technical support for the Bell operating companies was provided by AT&T, Bell Laboratories and Western Electric. Today, the Bell operating companies are owned by seven independent regional companies. While the Bell operating companies still have access to Western Electric products and AT&T Bell Laboratories capabilities, these are now just two of the many outside organizations that are competing for the postdivestiture Bell operating companies' business.

Unbiased, centralized technical support is now delivered to the Bell operating companies by Bell Communications Research, Inc. Bell Communications Research was formed at the request of the seven regional companies and is owned and funded by them. It is the operating companies' in-house technical organization: It helps the Bell operating companies improve their networks and expand the capabilities of Centrex and other services.

Bell Communications Research provides in-depth technical guidance in several major areas. These include the development of generic equipment requirements, operations, standards and compatibility, software to support operations, network evolution and equal treatment of interexchange carriers such as MCI Communications Corp., GTE-Sprint Communications Corp. and AT&T Communications. It ▶

Dorros is executive vice-president, Bell Communications Research, Inc., Livingston, N.J.

RICH TENNANT

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is helpful to examine each of these areas.

In the past, the Bell operating companies could count on AT&T's Western Electric as their major supplier. Today, however, equipment procurement is solely in the hands of the the Bell operating companies. They need to choose the best, most reliable equipment for their networks. This equipment must provide the features that the Bell operating companies need and must perform in a dependable fashion. The quality in these products must be built in, not added on. The Bell operating companies use hundreds of computer programs to support planning, engineering, maintenance and administration of their networks. These systems are part of the core technology of the telephone plant and are a major reason for the Bell operating companies' high rate of productivity. The companies literally could not run their networks without them. Before divestiture, many of the most sophisticated of these programs and the methods for using them were designed and developed by Bell Laboratories.

It is no accident that a telephone call that originates in New York can automatically be completed in California over a high-quality connection. Before divestiture, the strong influence of the nationwide Bell System assured that there would be nationwide service and equipment standards available. AT&T, assisted by Bell Laboratories, developed and implemented standards for services and equipment throughout its own local and long-distance networks. Independent companies received these standards through the U.S. Independent Telephone Association and often followed them. But the Bell operating companies do not have AT&T available to perform these functions anymore.

The Bell operating companies must evolve their networks by integrating new technology, by developing new methods to save on capital and expense and by increasing their new service capabilities. This evolution will position the Bell operating companies' networks to meet future service demands through robust network architectures, supporting a wide variety of services at the lowest possible cost. AT&T and Bell Labs used to develop the plans and methods that the Bell operating companies used in developing their network evolution plans.

The Bell operating companies must provide all interexchange carriers with exchange area access that is equal in price, quality and type to the access provided to AT&T Communications. This implies technical equality in connection quality, connection delay and probability of blocking. This equality must be carefully developed and planned.

While this list of challenges is far from complete, it gives the flavor of what is needed to support the technically sophisticated Bell operating companies' networks in the competitive, postdivestiture telecommunications market.

Nearly 8,000 experienced telecommunications professionals from Bell Communications Research provide this service. Almost half are from Bell Laboratories and the rest come from AT&T, Western Electric and the Bell operating companies. Whatever their past backgrounds, as Bell Communications Research employees, their futures, loyalty and paychecks are all con-

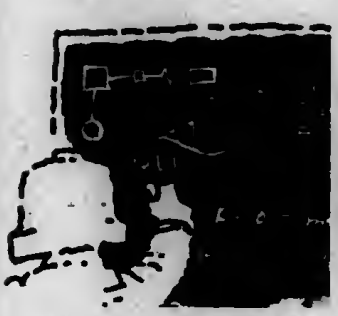
Bell Communications Research

trolled by the Bell operating companies.

Since the regional Bell operating companies share the cost of Bell Communications Research, the research entity provides its technical expertise at a much lower cost per region than if each region were to seek or develop this expertise individually. Bell Communications Research also offers the Bell operating companies the benefits of technical synergy in standards, generic requirements, applications and national service guidance. The following are a few of the reasons why the regional Bell operating companies have joined together to fund and direct the work of Bell Communications Research.

One major reason is Bell Communications Research's applied research department. This group of mathematicians, physicists, engineers and other technical professionals, works on everything from corrosion in materials to new applications for optical fiber in the loop to the development of distributed data base architectures for computer networks.

Applied research will enable Bell Communications Research to judge what should be offered by manufacturers as well as how good existing products really are. In addition, it will let the Bell operating companies know which new technological avenues, such as lightwave switching, and which



new service-providing capabilities, such as wideband architectures for high-capacity services, are the best options to pursue.

Nationwide service is taken for granted. But how would a large business customer react to different service procedures and standards in each region of the country? Consider the disadvantages of having seven regional 800 numbers and totally different independent regional service capabilities vs. one nationwide 800 number with a basic, uniform set of service capabilities.

Other disadvantages include the physical, electrical and procedural requirements for connecting the myriad of terminals of different types, vintages and manufacturers together to communicate with each other or to access centrally stored information. The Local-Area Data Transport service offered by Southern Bell demonstrates how various terminals can use public networks for banking, information access and other services.

Nationwide customers will not

How would a large business customer react to different service procedures and standards in each region of the country? Consider the disadvantages of having seven regional 800 numbers and totally different independent regional service capabilities vs. one nationwide 800 number with a basic, uniform set of service capabilities.

stand for significant differences in service standards and procedures among their different locations. These differences increase their costs and lower their communications capabilities. These customers, who are the lifeblood of the Bell operating companies' revenue stream, would let their fingers do the walking straight to a nationwide company that could offer them identical nationwide services — GTE-Sprint, MCI, AT&T or any of the other entrants that will bypass the Bell operating companies — if the price, market and technology are right. But through assistance from Bell Communications Research, the Bell operating companies can voluntarily develop nationwide service standards and procedures.

Being a major force in national telecommunications requires the delivery of quality services — a major selling point for the Bell operating companies. Bell Communications Research has people

Bell Communications Research

who developed network performance standards in the past and who will help the Bell operating companies develop them in the future. But it takes more than just setting good objectives.

Service performance and the performance of network components must be sampled, measured and analyzed by the Bell operating companies, using scientifically designed methods. Problems must be isolated and corrected so that they do not affect service.

Service performance and the performance of network components must be sampled, measured and analyzed by the Bell operating companies, using scientifically designed methods. Problems must be isolated and corrected so that they do not affect service.

Bell Communications Research will provide the Bell operating companies with the methods they need to measure, maintain and improve their network and service quality.

The Bell operating companies also count on Bell Communications Research expertise for insight into network evolution to improve network economy and capability.

Bell Communications Research provides a large number of software programs and systems that the Bell operating companies use to plan the timing, sizing and location of new transmission facilities, switches and loops and the training courses needed to use these tools.

In addition, Bell Communications Research provides the computer programs for major data base systems. These systems, if fully deployed by all the companies, would contain records on more than $70-billion worth of Bell operating companies' inventoried plant, including the loops, central office, interoffice and plug-in equipment that are the backbone of telecommunications.

These Bell Communications Research computer software systems have allowed for a more efficient use of inventory and for the mechanization of previously manual clerical functions. They have already saved the Bell operating companies well over $3 billion.

Bell Communications Research is now developing methods that enable each region to tie these and other of its systems together into a "system of systems."

Under this "system of systems" concept, a service representative could set up a customer's service

Bell Communications Research

in a single transaction at a computer terminal. The interactive programs would find the right facilities, prepare the right records and make the right connections. This would offer customers instant service, where a business or residential customer's service can be provided under the control of computers while the customer is still on the line requesting service.

Bell Communications Research also develops generic equipment requirements describing the desired features and functions of digital switches, optical-fiber systems, signaling systems and other network components. These requirements are written in a generic fashion: They do not specify how a system should be designed or how the system should perform a specific function, but they do specify what the system should do.

This Bell Communications Research function strongly supports competition in the equipment area, since the Bell operating companies can use whichever portions of the requirements they desire in dealing with a wide range of manufacturers. Bell Communications Research also provides quality assurance methods and inspection, ensuring that the Bell operating companies get the quality they need and are paying for.

An example of generic requirements is the "Local Switching System Generic Requirements" (LSSGR) — a seven-volume, 1,500-page set of binders describing the features and functions of local switching systems. LSSGR has been used by the Bell operating companies as one of the tools in selecting an increasing number of Northern Telecom, Inc. switches.

Of course, since each Bell operating company makes its own purchasing decisions, it is free to choose which features specified in LSSGR that it wants to require in the local switching systems that it purchases.

Bell Communications Research is owned and controlled by the regional companies, and it works only on projects that the Bell operating companies specify: The Bell operating companies use Bell Communications Research advice as they see fit. By providing direct technical support to the Bell operating companies, Bell Communications Research will be a major factor in the continuing success and quality of U.S. telecommunications.

As U.S. Federal District Court Judge Harold Greene said on Feb. 6, 1984, "In a very real sense, [Bell Communications Research] is charged with responsibility for the protection of the high standards of the American phone system. As long as it carries out that responsibility without discrimination or unfairness, it will have the Court's unwavering support." ■

CALENDAR

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JUNE 19-22, CHERRY HILL, N.J. — *Implementing Local-Area Networks.* Also June 26-29. Contact Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, P.O. Box 45405, Los Angeles, Calif. 90045.

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JUNE 20-22, GREENWICH, CONN. — *Data Communications.* Also, July 11-13, Hasbrouck Heights, N.J. Contact: Center for Advanced Professional Education, 1820 E. Garry St., Santa Ana, Calif. 92705.

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JUNE 21-22, NEW YORK — *Understanding Telecommunications Technologies for Non-engineers.* Contact: Telestrategies, Inc., 6842 Elm St., Suite 102, McLean, Va. 22101.

JUNE 24-27, ATLANTIC CITY, N.J. — *ADCU Annual National Conference.* Contact: Association of Data Communications Users, P.O. Box 20163, Bloomington, Minn. 55420.

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EXIT

James Vinick and his daughter Beth with their glut of AT&T calling cards

This horror story was told by James Vinick, a senior vice-president for Dean Witter Reynolds, Inc. in Springfield, Mass. to On Communications *Editor Bruce Hoard.*

"This past January, I received a new telephone calling card from New England Telephone after having problems with my previous one and canceling it. The problems continued when my April telephone bill reflected charges for calls I hadn't made from both New England Telephone and AT&T Information Systems. Both firms assured me that they would credit my account for the extra charges. They did not try to figure how things had gone wrong.

"It wasn't long before I came home one night and discovered 246 packages of mail from AT&T Communications in Baskinridge, N.J. Each package contained a telephone calling card I had not ordered. Nobody at the emergency 800 number listed on the cards knew what was wrong or what could be done.

"The next day, I called Gerald Elsworth, who was listed as national customer service manager on the cards. He was very cordial and very upset that this had happened. When he got back to me, he had good news and bad news. The good news was that they were going to do everything they could to solve the problem. The bad news was they had discovered that 971, not 246, cards had been ordered in my name.

"Elsworth implied that the card order was sent from the local telephone company to AT&T prior to the Jan. 1 AT&T divestiture. Since Jan. 1, I was told, AT&T no longer provided an AT&T calling card to people who ordered cards from the local companies. Therefore, the situation was tied to the old card I had canceled. He told me the additional 725 cards were coming to me via National Data Corp. in Atlanta. Before I left for a trip, National Data called me to say they would leave no stone unturned in the efforts to track down the snafu.

"When I returned from the trip, my son told me that the mailman showed up at our door with three large mail sacks of envelopes that carried the additional 725 cards. All three bags were sitting on my kitchen floor.

"The people in Baskinridge called back a couple of times to tell me they would pick up the cards. I told them point-blank I wanted a letter of indemnification, freeing me from any potential charges associated with the cards, and a receipt for each card.

"ABC showed up to film all this, and I am tied in with Channel 40 here in Springfield, where I do financial editorials.

"They just happened to pick on the wrong guy."

Next Month:

AT&T: Six Months After

- AT&T Communications in Distress
- The Regional Companies Take Hold
- The View From AT&T
- What Users Are Finding Out

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